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BULLETIN NO. 19

BUREAU OF EDUCATIONAL RESEARCH
COLLEGE OF EDUCATION

THE PROGRESS AND ELIMINATION OF SCHOOL CHILDREN IN ILLINOIS

By

CHARLES W. ODELL

Associate, Bureau of Educational Research

PRICE 50 CENTS

PUBLISHED BY THE UNIVERSITY OF ILLINOIS, URBANA
1924

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The results of original investigations carried on by the Bureau of Educational Research are published in the form of bulletins. A complete list of these publications is given on the back cover of this bulletin. At the present time five or six original investigations are reported each year. The accounts of research conducted elsewhere and other communications to the school men of the state are published in the form of educational research circulars. From ten to fifteen of these are issued each year.

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Bureau of Educational Research
College of Education
University of Illinois, Urbana

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PREFACE

As a result of the studies of Maxwell, Thorndike, Strayer and Ayres, school administrators have come to realize that the rate of progress of pupils through a school system is a significant index of its efficiency. The usual method of computing this index is by means of the well-known age-grade table, but a study of this procedure reveals that it is faulty. In this bulletin Dr. Odell presents an extended inquiry into the validity of the age-grade procedure and shows conclusively that the results obtained by it can not be accepted as a valid index of the efficiency of a school system.

Educational research is rapidly extending its influence over educational practice. If this influence is to be beneficial, it is imperative that faulty techniques in the collection and in the interpretation of data be discovered and discarded. Formerly, when much less significance was attached to statistical tables and to other results of research, responsibility for carefully scrutinizing the procedure used was less than today when an announcement made upon quantitative data is likely to be accepted widely and to effect significant changes in educational practice. Thus, investigations of the type represented in this bulletin should be welcomed by those engaged in the administration of our schools as well as by those primarily interested in problems of educational research.

The investigation reported by Dr. Odell is based upon the cooperation of a large number of superintendents, to all of whom the Bureau of Educational Research gratefully acknowledges its indebtedness.

WALTER S. MONROE, *Director.*

March 26, 1924

THE PROGRESS AND ELIMINATION OF SCHOOL CHILDREN IN ILLINOIS

CHAPTER I

INTRODUCTION

Development of interest in measures of progress and elimination of school children. Within the last twenty years measures of the progress of school children have come to be recognized as significant indices of the efficiency of a school system. Two types of measures of the progress of children through a school system have been used. The first has been computed from age-grade tables,[1] and includes the "average over-ageness," the "percent of pupils over-age or retarded," the "percent of pupils at-age or normal," and the "percent of pupils under-age or accelerated." These measures will be referred to in this bulletin as "age-grade indices." The second type of measures may be called "indices of progress" and are computed from tables showing years (semesters)[2] in school and years (semesters) of progress. This type includes the "average rate of progress," i.e., "average number of years (semesters) of progress made in one year (semester) of time," the "percent of pupils making fast progress," the "percent of pupils making regular progress," and the "percent of pupils making slow progress."

School administrators have become interested also in measures of the extent to which children leave school in the upper grades and the high school and indices of elimination have frequently been calculated in connection with studies of progress.[3]

One of the first prominent educators to become interested in measures of the progress and elimination of school children was Superintendent W. T. Harris of St. Louis. Over fifty years ago he called attention to the significance of these measures, but in this, as in other matters, he was ahead of his time and failed to arouse any general interest. Practically no attention was given to either progress

[1]An age-grade table is one which gives the number of pupils of each age group belonging to each grade. For an illustration of this type of table see Table XIII, page 32.

[2]In some tables of this kind the semester has been used instead of the year. For an illustration see Table I, page 15.

[3]See Chapter V for a description of the indices of elimination.

or elimination until 1904. In this year Superintendent Maxwell of New York City included in his annual report[4] an age-grade study of the elementary schools of that city. This publication stimulated other superintendents and influenced them to include similar studies in their annual reports. A number of rather comprehensive investigations were also made, of which Thorndike's study, "The Elimination of Pupils from School,"[5] in 1907 appears to have been the first. It was concerned chiefly with elimination but some attention was given to retardation and acceleration. A couple of years later (1909) Ayres published a somewhat more comprehensive investigation under the title "Laggards in Our Schools."[6] Although Ayres' report is concerned chiefly with age-grade and elimination data, one chapter deals with progress. This seems to be the first instance in which indices of progress are mentioned in any well-known publication. In 1911 Strayer published a study[7] which presented age-grade data for a number of city school systems, colleges, and universities. The same year two other books appeared, one[8] of which deals chiefly with the progress of pupils rather than with age-grade conditions and the other[9] with retardation.

Since these early studies there have been numerous others treating various phases of progress and elimination. Among the more recent is a report[10] by Ayres which deals with both indices of progress and age-grade indices. About the same time Hill and Railey[11]

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[4]Maxwell, W. H. "Sixth annual report of the city superintendent of schools," New York, 1904, p. 42-49.

[5]Thorndike, E. L. "The elimination of pupils from school." U. S. Bureau of Education Bulletin No. 4. Washington, 1907. 63 p.

[6]Ayres, L. P. "Laggards in Our Schools." New York: Charities Publication Committee, 1909. 246 p.

[7]Strayer, G. D. "Age and grade census of schools and colleges." U. S. Bureau of Education Bulletin No. 5. Washington, 1911. 144 p.

[8]Keyes, C. H. "Progress through the grades of city schools." Teachers College Contributions to Education, No. 42. New York: Teachers College, Columbia University, 1911. 79 p.

[9]Blan, L. B. "A special study of the incidence of retardation." Teachers College Contributions to Education, No. 40. New York: Teachers College, Columbia University, 1911. 111 p.

[10]Ayres, L. P. "Child accounting in the public schools." Survey Committee of the Cleveland Foundation, Cleveland, Ohio, 1915. 68 p.

[11]Hill, D. S. and Railey, Mary L. Educational Research in Public Schools. Part I. Comparative Measurements of the Progress in a School of 36,000 children at New Orleans, p. 11-35. Part II. A Practical Study of the Elimination of Pupils from the New Orleans Public Schools, p. 39-161. New Orleans: Board of Education, 1915.

published an unusually complete study of progress and elimination in New Orleans. Some years later Hill,[12] in a brief discussion pointed out that progress is more potent than age at entrance in determining age in grade, and states that 70 percent of retardation is due to failure. The Virginia Survey,[13] which appeared in 1920, also devoted some attention to progress as well as to age-grade data. Recently Superintendent Ettinger[14] of New York City has used both kinds of data in studying the status of the public schools of New York City.

Indices of progress versus age-grade indices. An examination of the studies mentioned above and of many others that have appeared during recent years shows that there has been a steady increase in the use of "indices of progress" in preference to "age-grade indices" as measures of the progress of children through school systems. However, age-grade indices are still used by a majority of school men. This is probably due to two facts: first, it has been assumed that the correlation between the two types of indices is so high that one can be used for the other; and secondly, age-grade data are more easily secured than the data necessary to compute indices of progress. Unfortunately, the records of many of our school systems, if they exist at all, are in such condition that the history of pupils can not be traced back to the time of entrance. The trend toward the use of indices of progress, as well as the opinions of those who have given serious attention to the problems, indicates that indices of progress are to be preferred to age-grade indices. However, there is available no comprehensive investigation showing the relative merits of these two types of measures of progress.

The major problem of this study. The major problem of this study is to determine the reliability or accuracy of age-grade indices as measures of the progress of pupils through a school system. In dealing with this problem a comparison will be made between age-grade indices and the corresponding indices of progress.

Minor problems studied. The data collected furnished an opportunity for the study of several minor problems:

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[12]Hill, D. S. "Remaining errors in measures of retardation," Elementary School Journal, 19:200-12, May, 1919.

[13]Inglis, A. J. et al. Virginia Public Schools. Part I. Chapter IV: Progress of Pupils in the Schools, p. 79-95. Yonkers: World Book Company, 1920.

[14]Ettinger, W. L. "Facing the facts," Bulletin of High Points in the Work of the High Schools of New York City, 4:3-15, October, 1922.

(1) A determination of age-grade indices and indices of progress for ninety-six[15] school systems in Illinois.

(2) A determination of an index of elimination or, stating it conversely, an index of the holding power, of the same school systems.

(3) A determination of the extent to which children migrate from one school to another.

(4) A study of the size of class in elementary schools.

(5) A study of departmental work in elementary schools.

Nature and source of data. The data on which this investigation is based were gathered in the autumn of 1922 through the cooperation of a large number of superintendents, principals and teachers. A letter was addressed to the superintendents and high-school principals of Illinois inviting them to cooperate in the study. To those who replied favorably there were sent a "supplementary questionnaire" and a sufficient number of copies of the "progress record blank" for their school systems.[16] The supplementary questionnaire asked for information concerning the general organization of the school system, the relation of the boundaries of the districts to the city limits, and the attendance at parochial and private schools. The progress record blank called for the following items of information for each pupil enrolled in the school: (1) name, (2) resident or non-resident, (3) age last birthday, (4) date of next birthday, (5) date of entering school in this city, (6) grade entered, (7) grade at present, (8) number of times failed of promotion, (9) number of times skipped, (10) number of semesters out of school, (11) for high schools only, (a) number of semester credits, (b) number of credits lost by failure, (c) date of entering high school.

It will be noted that these items have been chosen so that it is possible to make a partial check upon the accuracy of the entries. For example "semesters of progress" is found by taking the difference between items 7 and 6, and is also equal to the number of semesters which have elapsed since the pupil entered his present school minus the number of semesters failed or out of school plus the number of semesters of work skipped. By computing the "semesters of progress" in both of these ways many errors in the

[15]These 96 systems include the elementary or high schools, or both, of 92 cities and towns, and rural elementary schools in four counties. A list of them is given in Appendix B.

[16]This questionnaire and the progress record blank are reproduced in Appendix A.

original data were detected and appropriate corrections made. Other errors were also apparent and easily corrected. When it was not possible to infer what correction should be made, a letter was addressed to the superintendent or principal who had supplied the data, calling his attention to the errors and asking for corrections. The records of about 10,000 children were corrected in this way. The use of these two methods for correcting the original data and the care with which the computations and tabulations were made, cause the writer to believe that the errors in this investigation have been reduced to an exceedingly low minimum.

Number and distribution of cooperating school systems. Data were secured from eighty-two elementary school systems and fifty-one high schools, representing in all ninety-two different communities. In addition three counties contributed data for most or all of their elementary rural schools and one other county furnished data for a few schools which the county superintendent considered a fair sample of all those in the county. In all, usable individual records were obtained for approximately 67,000 resident pupils; of whom about 53,000 were in city and town elementary schools, 5,500 in rural elementary schools and 8,500 in high schools. Data for about 3,000 non-resident pupils were also obtained, but are used only in the study of class size. With this exception, all statements in the following chapters refer to resident pupils.

The school systems contributing data were well distributed geographically. If the three sections into which the state is divided for the election of members of the Illinois State Teachers Examining Board are taken, the distribution of system is as follows:

	Northern	*Central*	*Southern*
Number of Elementary School Systems	42	23	17
Number of High Schools	25	16	10
Percent of Pupils	47	26	27

The number of schools as well as the percent of pupils is larger for the northern section than for either of the others. However, the northern section of the state includes a much greater portion of the total population of the state. Omitting Chicago, which took no part in the study, the percents of the total population of the state found in the three sections are 45, 29 and 26, respectively. The distribution of the pupils included in the study in the three sections when expressed as percents agrees very closely with the distribution of the

population. Thus we may see that with respect to the general geographical distribution, the town and city schools participating in this investigation may be considered fairly typical of the state as a whole. In the case of the rural schools the same claim can not be made as four counties out of 102 are not enough to constitute a fair sampling; although the geographical distribution of the counties cooperating, two in the northern section, one in the central, and one in the southern, makes the data more representative of rural schools than if all the four counties had been from the same section.

Grouping of school systems. In order to facilitate comparisons between schools similar in size and type of organization, the following grouping was made:

Elementary Schools			*High Schools*		
Class	*Population of City*	*Number of Systems*	*Class*	*Enrollment*	*Number of Systems*
I	30,000 or more	3	A	500 or more	3
II	10,000-29,999	8	B	300-499	8
III	2,500-9,999	30	C	100-299	24
IV	Less than 2,500	41	D	1-100 (4 yr.)	11
			E	2 and 3 year	5

Within each of these classes a further grouping was made to bring together those systems in which annual and those in which semester or semi-annual promotions prevailed. In a number of school systems a combination of these two types of organization was found, and the system was arbitrarily placed in one or the other of these two groups. In case one type of organization prevailed in the elementary school and the other type in the high school of a given city, each division of the system was classified according to its plan of organization. A few elementary schools were found in which annual promotions prevailed in certain grades or buildings and semi-annual in others, and were classified as having the semester plan of organization. In one or two systems promotions were made at the end of each term in at least some of the grades, and these also were placed with the semester group.

In the study of elimination, it was necessary to combine the elementary and high-school data for those systems which supplied both. The term "single unit system" is used to designate those in which the elementary and high-school districts are coterminous. In almost all cases this means that they are under the control of the

same school board. The term "whole systems not coterminous" is used for those communities in which the boundaries of the elementary and of the high-school districts do not coincide. In combining the data from the two divisions of such systems for the study of elimination, appropriate adjustments were made so that only those high-school pupils living in the elementary-school districts were included.

Rural schools were grouped according to whether they were one-room or two to four-room schools, but since no significant differences were found except in class size this classification is not retained in the tables of this report.

Procedure followed in irregular cases. Pupils who entered school at some time other than at the beginning of the year or semester were considered as having entered at the beginning. An exception was made in the case of rural-school pupils who entered the first grade in March or later and remained there all of the next year; they were placed with the group entering school the following September. In some instances it was not stated whether the pupil was a resident or non-resident, and it was assumed that he lived within the district.

The data from six or eight systems were peculiar in that they were not complete or that the plan of organization was so different that they could not be handled in the usual manner. In these cases the data were transmuted into an equivalent form similar to that received from the other systems. For example, in systems having the term plan of organization, the pupils in Grade I C and one-half of those in I B were grouped together to represent those who would be in I B in a system organized on the semester basis, and the other half of those in I B and all in I A, to represent those who would be in I A. In doing this the I B pupils were paired on the basis of the measure being used and one of each pair assigned to I B, the other to I A.

CHAPTER II

INDICES OF PROGRESS

The indices of progress used. The following indices of progress were calculated: (1) "average progress per semester or year," (2) "percent of pupils making fast progress," (3) "percent of pupils making regular progress," (4) "percent of pupils making slow progress." In the calculation of these indices of progress all non-resident pupils were excluded. In systems having annual promotions the "average progress" is calculated by dividing the total number of years of progress made by all pupils[1] by the total number of years spent in school. A corresponding definition of "average progress" may be stated for school systems having semi-annual promotions. The "percent of pupils making fast progress" is the percent of pupils whose years (semesters) of progress are more than the years (semesters) they have spent in the school system. The "percent of pupils making regular progress" is the percent whose years (semesters) of progress equal the number of years (semesters) spent in school. The "percent making slow progress" is the percent of pupils whose years (semesters) of progress are less than the number of years (semesters) spent in school.

Method of calculating indices of progress. In calculating the "indices of progress" the facts relating to years (semesters) in school and years (semesters) of progress were assembled in a progress table. Such a tabulation for all city and town elementary schools is shown in Table I. In some of these schools annual promotions prevailed and in others children were promoted at the end of each semester. This table is to be read as follows: the entries on the first line of the table are for pupils who have made no progress, that is, who are in the beginning grade of the school. Of the total number, 9634 have spent no semesters in school, that is, they entered in September, 1922; 225 have spent one semester in school; 1305, two semesters in school; 6, three semesters in school; and so on to 2 pupils who have made no progress but have spent

[1]This refers only to the progress made by the pupils in the school in which they were enrolled in September, 1922. A similar statement applies to the total number of years spent in school.

TABLE I. THE PROGRESS OF PUPILS IN ELEMENTARY SCHOOLS

Semesters of Progress	Semesters in School																									Total	Aver-age Rate	Percent		
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	30			Fast	Reg.	Slow
0	9634	225	1305	6	143	1	21	2	5		2																11344	....	0	85	15
1	34	870	611	54	39	3	4	1	1																		1617	1.52	2	54	44
2	27	34	6034	247	1338	21	239	1	45		10		3	1	1												8001	1.27	1	75	24
3		11	193	561	543	67	75	13	6	2	1	1	1														1474	1.18	14	38	48
4	3		100	95	4596	212	1204	44	299	7	68	1	12		1												6642	1.16	3	69	28
5			3	12	219	473	392	108	115	16	14	4	4		1												1361	1.13	17	35	48
6	1		3	1	116	54	3429	177	1125	45	269	7	64	3	18		4	1	4				1				5322	1.13	3	64	32
7				2	8	16	213	316	359	63	85	19	15	9	10		2		1	1							1119	1.10	21	28	50
8					8		144	51	2565	114	953	37	302	7	118		32		6				1				4338	1.12	4	59	36
9						1	6	13	170	230	272	77	94	43	35	5	4	1	1								952	1.11	20	24	56
10					2		7		138	29	2118	103	782	25	300	8	74	2	23	1	2		1			1	3616	1.07	5	59	37
11								1	4	6	139	180	226	54	88	14	19	5	2	1	1						740	1.08	20	24	55
12									4		119	36	1791	94	714	27	273	9	51	1	13		2		1		3135	1.08	5	57	38
13											3	12	133	125	178	37	53	11	15		2						569	1.05	26	22	52
14											13	3	122	30	1452	72	565	27	180	3	32	1	5				2505	1.06	7	58	35
15											1		2	6	110	106	119	34	38	9	2	1					428	1.03	28	25	47
Total	9699	1140	8249	978	7012	848	5734	727	4836	512	4067	480	3551	397	3026	269	1145	90	321	16	52	2	10		1	1	53163	1.12	5	65	31
Average Progress	....	.85	.83	.92	.88	.92	.85	.90	.90	.90	.91	.91	.88	.90	.90	.91	.82	.80	.73	.71	.66	.69	.54		.50	.33	.89				

ten semesters in school. The average rate can not be computed, as these pupils have made no progress. None of them have gained time, 85 percent have neither gained nor lost time, and 15 percent have lost time. Table II presents the same sort of data for high schools. Tables similar to these were constructed for each school system and for each group of school systems. In addition to being a means of computing indices of progress such a table is illuminating concerning one phase of the general status of schools. The extreme variability is perhaps the most notable characteristic of these tables.

In computing the time spent by those children recorded in a column of Table I, the total of the column is multiplied by the number at the top. For example, 8249 is multiplied by 2, giving a total of 16498. The semesters of progress for a column group of children is computed by multiplying each entry in the column by the number of semesters of progress made by those children. For example, in the third column of Table I the computation is: $1305 \times 0 = 0$; $611 \times 1 = 611$; $6034 \times 2 = 12068$; $193 \times 3 = 579$; $100 \times 4 = 400$; $3 \times 5 = 15$; $3 \times 6 = 18$. The sum of these products, 13691, gives the semesters of progress made by all of the children recorded in the column. This sum divided by the semesters in school (16498) gives the "average progress" .83, which is entered in the last row of the table. A reversal of the process yields the "average rate" of a row, that is, the average number of semesters (years) required to make one semester (year) of progress.

General indices of progress for elementary schools in Illinois. As may be seen in Table I the average progress for all elementary-school pupils is .89. This means that on the average pupils in the elementary schools have made .89 semester (year) of progress for each semester (year) spent in school. Assuming that the data collected in this investigation are representative of conditions in the state outside of Chicago, this figure may be taken as a general index of progress in the elementary schools of towns and cities in Illinois. An average progress of .89 means that the average pupil now in school has progressed at a rate which if maintained would require him to spend approximately nine years in completing the eight grades of the elementary school. In view of the fact that our elementary school system is nominally one of eight years and is generally considered so, this condition is peculiarly significant. When we recall that a number of educators are very insistent that the work

TABLE II. THE PROGRESS OF PUPILS IN HIGH SCHOOLS

Semesters of Progress	Semesters in School											Total	Average Rate	Percent		
	0	1	2	3	4	5	6	7	8	9	10			Fast	Reg.	Slow
0	2822	54	157		16		2					3051	....	0	92	8
1		288	120	7	4		1					420	1.36	0	69	31
2	1	4	1759	48	192	4	15		3		1	2027	1.13	0	87	13
3			83	142	105	14	8	2	1			355	1.08	23	40	37
4			4	27	1184	36	117	2	14			1384	1.06	2	86	12
5				1	134	67	65	6	3	1		277	.97	49	24	27
6					30	16	770	26	45	3	3	893	1.01	5	86	9
7						3	110	51	21	2	1	188	.93	60	27	13
Total	2823	346	2123	225	1665	140	1088	87	87	6	5	8595	1.08	5	82	13
Average Progress	....	.86	.92	.95	.94	.89	.96	.91	.71	.69	.54	.93				

of the elementary school should be done in seven years, the fact that our present system in Illinois is essentially a nine-year system is given added significance.

Taking the state as a whole,[2] approximately one pupil in twenty has been allowed to make fast time, slightly less than one in three has lost time and approximately two-thirds have made regular progress. It perhaps should be noted that this statement refers only to the time which pupils have spent in the system in which they were found November, 1922. It is probable, however, that if the complete records of pupils were available there would be little change in the indices.

It will be seen also from Table I that, between the range of three and fifteen semesters in school, there appears to be no relationship between the number of semesters that pupils have been in school and the number of semesters of progress they have made. Apparently pupils who have been in school only one or two semesters average less progress than do pupils in general. It is of course inevitable that those who have been in school more than fifteen semesters average less progress as there is no possibility of increasing their total progress beyond fifteen semesters, while the total time in school increases. The average rates, on the other hand, show that there is a very definite tendency for pupils who have made the greater amounts of progress to have done so more rapidly. This is merely another way of saying that those pupils who progress relatively far in school are the ones who are failed least often. The percents of pupils fast and slow show an increase that varies directly with the number of semesters of progress made; that is to say, the farther they go in school the more chance they have of getting out of the beaten track. This agrees with a priori expectation.

Progress indices for single elementary school systems. The four indices of progress for pupils in elementary schools have been calculated for each school system, and are summarized in Tables III and IV. The former is for those systems having semi-annual promotions and the latter for those having annual. Even a casual inspection of these tables reveals considerable variation between the different systems. The extremes of average progress are .79 and .99. There are several systems in which no pupils have made fast progress while in one system 25 percent have done so. The percent of pupils making regular progress varies from 40 to 91, and of those

[2]This should be interpreted as meaning towns and cities exclusive of Chicago.

TABLE III. INDICES OF PROGRESS OF PUPILS IN ELEMENTARY SCHOOLS HAVING SEMESTER PROMOTIONS

City Number	Average Progress	Percent		
		Fast	Regular	Slow
Class I				
9	.96	17	58	25
10	.94	10	68	22
37	.94	6	70	24
92*	.96	10	66	24
All	.95	13	63	24
Class II				
12	.92	9	58	32
13	.95	16	57	27
39	.89	7	46	46
46	.84	4	52	44
84	.86	4	55	41
All	.89	7	54	39
Class III				
1	.90	7	62	31
22	.93	9	62	29
25	.91	5	65	31
33	.84	3	51	46
42	.95	8	69	23
44	.93	7	70	23
49	.81	4	40	56
54	.98	22	60	18
65	.91	7	61	32
79	.90	10	48	42
All	.90	7	58	35
Class IV				
4	.99	25	50	25
18	.98	11	70	19
35	.91	4	65	31
59	.94	1	82	17
All	.95	10	67	23
All Semester	.91	8	58	34
All Sem. and Ann.	.89	5	65	31

*The data for this city are not included in the totals as they were received too late. Also they are for the second and not for the first semester of 1922-23.

making slow progress from 9 to 56. It should be noted that these differences are not extreme in the sense that there are no other systems for which the corresponding indices are approximately equal, for in every case there are several systems whose indices differ only slightly from the ones mentioned.

TABLE IV. INDICES OF PROGRESS OF PUPILS IN ELEMENTARY SCHOOLS HAVING ANNUAL PROMOTIONS

City Number	Average Progress	Percent		
		Fast	Regular	Slow
Class II				
51	.85	1	65	34
58	.87	2	68	30
60	.85	2	67	31
All	.86	2	66	32
Class III				
5	.91	2	79	19
15	.91	1	76	23
29	.91	3	78	19
31	.96	1	91	9
40	.85	4	64	33
41	.91	5	64	31
45	.93	2	83	14
47	.86	1	70	30
48	.94	1	84	15
52	.86	7	49	44
53	.84	2	65	33
62	.89	4	71	24
66	.80	1	60	39
67	.83	1	66	33
70	.92	2	77	21
71	.85	1	67	32
75	.92	.2	79	20
76	.96	1	85	14
82	.88	1	73	26
85	.86	1	71	38
All	.88	2	72	27
Class IV				
2	.88	0	73	27
6	.93	4	76	19
7	.87	2	69	29
8	.91	2	73	25
11	.91	3	75	22
14	.90	9	65	26
17	.89	1	71	28
19	.87	2	66	32
20	.85	0	62	38
21	.79	1	55	44
23	.91	4	75	21
24	.84	.4	65	34
26	.83	2	57	40
27	.83	0	65	35
28	.92	0	73	27
30	.95	1	85	13
34	.91	1	76	23
38	.84	2	65	33
43	.86	1	68	31
50	.96	5	80	15
55	.90	2	79	19
56	.93	6	72	22
57	.89	.4	81	18
61	.90	2	73	25
63	.87	1	69	29
64	.85	1	64	35
68	.93	3	78	19
69	.89	1	73	26
72	.90	0	80	20
73	.88	1	71	28
74	.84	3	58	39
77	.90	1	75	24
80	.88	1	68	31
81	.82	0	65	35
83	.90	1	72	27
86	.88	1	70	29
88	.86	0	63	37
All	.89	2	71	27
All Annual	.88	2	70	28
All Sem. and Ann.	.89	5	65	31
Rural				
1	.95	4	80	16
2	.88	3	68	29
3	.90	5	71	24
4	.89	10	63	27
All	.91	4	72	24

The difference between an average progress of .79 and one of .99 may not seem significant. However, if these indices are translated into the number of years required for an average pupil to complete the elementary school their meaning becomes more apparent. A pupil whose average progress is .79 would not complete the eighth grade until after the end of his tenth year in school; while one advancing at the average rate of .99 would need only three or four weeks more than eight years. Thus corresponding to these average rates of progress there is a difference of nearly two years in the time required for the average pupil to complete the elementary school.

The extreme differences in the percents of pupils making fast and slow progress are equally significant. There are several systems in which the organization appears to be so rigid and so lacking in provisions for superior pupils that no pupil in the elementary school has been allowed to gain any time. There are many other cities in which not more than one pupil in one hundred has gained. On the other hand there is one system in which less than one pupil out of ten has lost time, whereas in another more than one out of two has done so. In one system only two-fifths of the pupils and in another more than nine-tenths have made regular progress. In view of the emphasis which is now being placed upon the necessity for making provisions for the individual differences of pupils, the fact that such conditions exist is particularly significant. The writer realizes that the indices used do not measure the amount of flexibility and provision for individual differences with perfect accuracy, but he can not believe that such large variations are justified. It seems evident that many systems are entirely too rigid in their organization, that a number are failing entirely too large a percent of their pupils, and that a few are probably allowing too many to gain time.

Influence of size of system and frequency of promotion upon indices of progress in elementary schools. A comparison of the totals in Tables III and IV for the separate groups reveals that the type of organization does influence the indices of progress. Although the figures for the schools having semester promotions and for those having annual promotions are not strictly comparable, it appears that in general pupils make somewhat more rapid progress in systems which have the semester plan of organization. It is shown also that the percent of pupils making rapid progress and the percent making slow progress are greater under the semester plan. This

fact may also be noted in Table I. Thus it is clear that a system having semi-annual promotions is more flexible than one having annual promotions. This is to be expected because when a failure or extra promotion involves the work of only one semester it is more likely to be given than when it involves the work of an entire year.

The size of the city appears to exert a minor influence, if any, upon the progress of pupils. Such differences as exist exhibit no consistent tendency and appear to result from chance or some other factor. However, the small number of Class I cities from which returns were secured limits the significance of any comparisons which may be made.

The basis of calculating indices of progress for high schools. Since progress in the high school is in terms of units rather than of either years or semesters, it was necessary to use a definite scheme, as given below, for translating units of credit into units of progress.

Semester Systems		*Annual Systems*	
Grade	*Number of Semester Units*	*Grade*	*Number of Semester Units*
IXB	0-1	IX	0-5
IXA	2-5	X	6-13
XB	6-9	XI	14-21
XA	10-13	XII	22-29
XIB	14-17		
XIA	18-21		
XIIB	22-25		
XIIA	26-29		

This plan was adopted because, in the first place, it seemed to represent the consensus of opinion and practice, in so far as there is any, and, in the second, it seems logical that if a pupil has not lost more than two semester units or, in other words, one year's work in a subject, he may be able to make up his loss and graduate with his class.

General indices of progress for high schools in Illinois. Tables II, V and VI present data relative to the high schools included in this investigation, and are probably as representative of the state as are the elementary schools. The general average progress is .93, which means that the average high-school pupil, if remaining until graduation, would require about four and one-third years to complete the course. One pupil out of every twenty has gained time,

TABLE V. INDICES OF PROGRESS OF PUPILS IN HIGH SCHOOLS HAVING SEMESTER PROMOTIONS

City Number	Average Progress	Percent		
		Fast	Regular	Slow
Class A				
9	.94	2	83	15
38	1.04	20	70	10
78	.98	17	66	17
All	.99	14	72	14
Class B				
5	.96	4	88	8
25	.93	5	79	15
51	.98	3	91	6
65	.92	3	81	16
84	.86	2	69	29
All	.92	3	81	16
Class C				
4	.73	0	65	35
18	.98	9	80	11
32	.99	21	82	17
59	.92	1	86	13
86	.99	11	79	9
All	.95	8	80	11
All Semester	.96	9	76	15
All Sem. and Ann.	.93	5	82	13

one out of every eight has lost, and slightly more than four out of every five have progressed at the regular rate.

Progress indices for single high schools. The indices given in Tables V and VI show an even greater variability than those for elementary schools. In certain high schools the average progress is only .73 or .74, in others it is 1.00, and in one it is 1.04. The average time required to complete a four-year high-school course corresponding to the average rates of progress varies from a few weeks less than four years to five and one-half years. A large number of high schools having annual promotions and one having semester promotions show no pupils who have made fast progress. In two or three high schools no pupils have made either fast or slow progress; on the other hand, in one high school 20 percent of the pupils have made fast, and in another 35 percent have made slow progress. It is not particularly surprising that in many high schools

TABLE VI. INDICES OF PROGRESS OF PUPILS IN HIGH SCHOOLS HAVING ANNUAL PROMOTIONS

City Number	Average Progress	Percent		
		Fast	Regular	Slow
Class B				
13	.93	1	90	9
36	.87	2	86	13
53	.94	0	95	5
All	.92	1	90	9
Class C				
2	.94	0	95	5
6	.96	1	91	8
8	.96	0	96	4
15	.79	1	78	21
16	.95	0	93	7
20	.91	0	89	11
23	.97	1	95	4
34	.74	0	73	27
41	.93	.5	91	9
43	.93	0	91	9
47	.84	0	82	18
52	.91	0	90	10
68	.98	1	97	2
70	.80	0	75	25
74	.87	0	84	16
76	.89	0	87	13
77	.91	0	89	11
79	.87	1	87	12
82	.95	0	93	7
All	.89	.2	87	13
Class D				
3	.96	0	98	2
21	1.00	2	96	2
27	.85	0	83	17
28	1.00	0	100	0
50	.99	0	99	1
55	.96	3	89	8
61	.86	0	84	16
64	.95	0	94	6
83	.95	0	94	6
90	.98	2	94	4
91	.82	2	78	20
All	.94	1	92	7
Class E				
38	.83	0	86	14
69	.97	0	97	3
87*	...	0	100	0
88	.87	0	96	4
89	.91	0	92	8
All	.90	0	93	7
All Annual	.90	.4	89	11
All Sem. and Ann.	.93	5	82	13

*Only 9th grade pupils are included.

TABLE VII. INDICES OF PROGRESS OF PUPILS IN SINGLE UNIT SYSTEMS

City Number	Average Progress	Percent		
		Fast	Regular	Slow
2	.93	0	77	23
9	.97	17	58	25
13	.99	21	55	54
15	.92	1	74	25
18	.97	11	70	20
21	.85	1	59	40
28	.93	0	76	24
39	.94	12	50	38
55	.93	3	77	20
59	.96	1	83	17
65	.93	8	62	30
69	.92	4	73	24
76	.95	2	80	18
77	.94	4	72	24
86	.92	5	68	28
All	.94	11	62	27

having annual promotions no pupils have gained a whole year. However, the question may be raised whether this is a satisfactory condition when the need for making adequate provisions for individual differences is considered. The discussion given in connection with the corresponding elementary-school data may also be applied here.

Influence of size of high school and frequency of promotion upon indices of progress. The differences between the indices for the different classes of high schools are more marked than for the elementary schools. This is especially true in the case of the first three classes of high schools having semester promotions: the average progress for pupils in Class A schools is .99, for those in Class B, .92 and for those in Class C, .95. There are corresponding variations in the other indices of progress. The average indices for the different classes of high schools having annual promotions show somewhat smaller differences. It does not, however, appear that either the type of organization or the size of school is a material factor in determining the average progress of pupils through the school. The flexibility of organization, as indicated by the percents of pupils making fast and slow progress, is greater in schools having semester promotions.

TABLE VIII. INDICES OF PROGRESS OF PUPILS IN WHOLE SYSTEMS NOT COTERMINOUS

City Number	Average Progress	Percent		
		Fast	Regular	Slow
4	.97	21	52	26
6	.94	4	77	19
20	.89	0	64	35
23	.92	4	76	21
27	.86	8	62	30
34	.92	1	73	26
38	.86	2	66	32
41	.92	5	66	29
43	.89	2	69	29
47	.90	2	69	29
50	.98	4	87	10
51	.89	1	65	33
53	.88	3	68	29
61	.91	3	71	26
64	.92	2	63	35
68	.95	5	78	18
74	.87	3	60	37
83	.92	3	72	25
88	.87	0	65	35
All	.90	3	68	29
All Entire Systems	.92	7	65	28

The indices of progress of pupils in systems from which both elementary and high-school data were obtained. Table VII gives the indices of progress of pupils in single-unit systems and Table VIII of those in whole systems not coterminous. The average progress for the former is .94, for the latter .90. Correspondingly, the percent fast for the former is considerably greater than that for the latter and the percent slow somewhat smaller. In other words, it appears that in unified systems pupils make better progress than in those not so organized. The general average progress for both is .92. If these data are representative of the whole state, the average Illinois pupil in a system having both elementary and high schools requires slightly over thirteen years to complete the course.

The variability of the indices given in these two tables is considerably less than that for either the elementary or high-school indices separately. Two causes at least for this fact may be given; (1) several of the systems which have extremely large or small

TABLE IX. THE AVERAGE PROGRESS OF PUPILS IN ELEMENTARY SCHOOLS HAVING SEMESTER PROMOTIONS, BY GRADES

City Number	Grade														All Grades
	IA	IIB	IIA	IIIB	IIIA	IVB	IVA	VB	VA	VIB	VIA	VIIB	VIIA	VIIIB	VIIIA	
Class I																
9	.77	.86	.97	.98	.98	.94	.95	.97	.97	.97	1.00	.97	.98	.96	.99	.96
10	.75	.92	.92	.93	1.11	.85	.99	.92	1.01	.91	.80	.98	.93	.94	.88	.94
37	.67	.93	.99	.96	.90	.97	.96	....	....	.93	.94	.97	.94	.96	.96	.94
92	.93	.84	.93	.99	.93	.99	.96	.96	.96	1.01	.94	.98	.98	.95	.98	.96
All Sem. I	.75	.89	.97	.97	.98	.93	.96	.95	.98	.95	.94	.97	.96	.96	.96	.95
Class II																
12	.67	.89	.91	.89	.88	.88	.93	.94	.92	.93	.91	.95	.93	.95	.97	.92
13	.48	.75	.80	.88	....	.91	1.15	.96	.94	.98	.89	.98	1.07	1.09	....	.95
39	....	....	....	.89	.85	.80	.90	.86	.88	.89	.88	.91	.92	.94	.96	.89
46	.54	.76	.75	.82	.78	.85	.83	.87	.82	.83	.88	.88	.88	.91	.96	.84
84	.65	.79	.82	.82	.87	.83	.87	.83	.85	.87	.85	.90	.92	.91	.95	.96
All Sem. II	.61	.79	.82	.86	.84	.86	.89	.89	.87	.89	.89	.92	.91	.95	.96	.89
All Sem. III*	.59	.78	.76	.85	.85	.88	.88	.90	.90	.90	.93	.94	.94	.96	.95	.90
All Sem. IV	.69	.84	.92	.92	.92	.94	.98	.99	1.00	.97	.97	.93	.93	.96	1.03	.95
All Semester	.64	.81	.78	.90	.90	.88	.93	.94	.94	.93	.93	.94	.94	.96	.98	.91

*Data for the single systems of classes III and IV are not given because the systems in these classes are so small that single-grade data are likely to be unreliable, due to the fluctuations in enrollment from time to time.

TABLE X. THE AVERAGE PROGRESS OF PUPILS IN ELEMENTARY SCHOOLS HAVING ANNUAL PROMOTIONS, BY GRADES

City Number	Grade							All Grades
	II	III	IV	V	VI	VII	VIII	
Class II								
51	.67	.77	.85	.88	.91	.89	.94	.85
58	.73	.83	.87	.85	.92	.91	.95	.87
60	.62	.81	.84	.87	.89	.93	.94	.85
All Annual II	.68	.79	.86	.87	.91	.91	.94	.86
All Annual III	.74	.83	.87	.88	.91	.92	.94	.88
All Annual IV	.77	.84	.86	.89	.90	.92	.94	.89
All Annual	.73	.82	.86	.88	.91	.92	.94	.88
All Sem. and Ann.	.77	.87	.89	.92	.92	.93	.96	.89

indices are represented in this study only by their elementary or their high schools, not by both; (2) the coefficient of correlation between the average progress in the elementary and in the high schools of the same city is practically zero. This second statement may be interpreted to mean that there do not appear to be unified promotion policies in the elementary and high schools of the same communities, regardless of whether they are single unit systems or not.

Average progress of pupils by grades. In the preceding tables average progress has referred to the average progress made in all grades combined. In Tables IX and X, the average progress of pupils in the various grades of the elementary schools in cities of Classes I and II is presented. In general, the average progress increases from the lower to the higher grades, although there are a number of exceptions, some of which are rather marked. The most noticeable of these is in the case of city No. 92, in which the average progress, except in II B and VI B, is very nearly the same throughout the different grades. This increase in the average rate of progress from the lower to the higher grades is in accord with common experience. The number of pupils failing is greatest in the first grade and least in the upper grades. The relatively small

TABLE XI. THE AVERAGE PROGRESS OF PUPILS IN HIGH SCHOOLS HAVING SEMESTER PROMOTIONS, BY GRADES

City Number	Grade							All Grades
	IXA	XB	XA	XIB	XIA	XIIB	XIIA	
Class A								
9	.83	.95	.90	.95	.98	.99	.96	.94
39	.87	.98	1.04	1.04	1.08	1.04	1.14	1.04
78	.65	.92	1.01	.92	1.12	.99	1.09	.98
All Sem. A	.77	.95	.98	.96	1.07	1.00	1.06	.99
Class B								
5	.56	.97	.75	1.00	1.02	.94	1.17	.96
25	.78	.96	.80	.89	.90	1.00	1.13	.93
51	.71	1.00	.72	.98	1.05	1.00	1.17	.98
65	.82	.90	.84	.93	.92	1.01	1.03	.92
84	.73	.87	.79	.83	.91	.94	.93	.86
All Sem. B	.75	.94	.80	.92	.97	.97	1.03	.92
All Sem. C	.53	.90	.97	.95	1.06	1.00	1.09	.95
All Semester	.74	.93	.92	.94	1.04	.99	1.06	.96

number of failures in the upper grades is due in part to the fact that many children leave school before completing the work of these grades.

Tables XI and XII present similar data for high schools, and show something of the same tendency, although the average progress is more irregular than that in elementary schools. The same explanations may be advanced here as given in the preceding discussion.

Relative value of the indices of progress. Of the four indices of progress which were calculated, the "average progress" is most significant of the general status of a school system. The other three indices—"percent of pupils making fast progress," "percent of pupils making regular progress" and "percent of pupils making slow progress" are useful for indicating something of the provisions which are being made for the individual differences of the pupils. For example, the average progress is the same in a system in which 5 percent of the pupils have made fast, 90 percent regular, and 5 percent slow progress as in one in which the percents are, respect-

TABLE XII. THE AVERAGE PROGRESS OF PUPILS IN HIGH SCHOOLS HAVING ANNUAL PROMOTIONS, BY GRADES

City Number	Grade			All Grades
	X	XI	XII	
Class B				
13	.89	.97	.91	.93
36	.81	.97	1.04	.87
53	.89	.97	.98	.94
All Annual B	.86	.97	1.00	.92
All Annual C	.83	.94	.98	.89
All Annual D	.89	.99	1.00	.94
All Annual E	.90	.98	....	.90
All Annual	.85	.96	.99	.90
All Sem. and Ann.	.96	.97	1.00	.93

ively, 20, 60 and 20. The figures for the second system are evidence that it is giving more attention to adapting the rate of progress to the individual differences of the children. However, the fact that its percents of pupils making fast and slow progress are small does not prove that a system has a non-flexible plan of organization and pays no attention to providing for individual differences.

CHAPTER III

AGE-GRADE INDICES

Age-grade indices used in this report. As a basis for defining and calculating age-grade indices, it is necessary to establish a "standard age" for each grade. There are several definitions of standard age which are in general use. In this investigation the age of six was taken as the normal age for entering the first grade of the elementary school. Thus for systems having semester promotions, six up to but not including six and one-half was taken as the normal age of entrance to Grade I B; six and one-half up to but not including seven as the normal age for entering I A; etc. For systems having annual promotions, six up to but not including seven was considered the normal age for entering Grade I; seven up to but not including eight as the normal age for entering Grade II, etc.

The following age-grade indices are used: (1) "Average over-ageness," (2) "Percent of pupils under-age or accelerated," (3) "Percent of pupils at-age or making normal progress," (4) "Percent of pupils over-age or retarded."

Method of calculating age-grade indices. As a means of calculating these indices, the facts relating to chronological age and grade location were summarized in an age-grade table, similar to the "progress and years in school" table used in calculating the indices of progress. The differences are that grade location is used instead of years (semesters) of progress and chronological age instead of years (semesters) in school. Table XIII summarizes the age-grade facts for all city schools including both elementary and high schools and corresponds in part to Tables I and II. It is to be read as follows: In Grade I, there are 78 pupils four years of age,[1] that is, whose ages are as much as four years but not as much as five years, 1731 pupils five years of age, 4525, six years of age, etc. The median age is 6.49 years. Twenty-five percent of them are younger than the standard adopted, 49 percent are at-age and 26 percent over-age.

According to our definition of standard age for grade those pupils in Grade I whose ages are less than six years are under-age

[1]All ages are computed as of September 1, 1922.

TABLE XIII. AGE-GRADE TABLE FOR ALL CITY SCHOOLS

Grade	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total	Median Age	Average Overageness	Percent		
																									Under Age	At Age	Over Age
I	78	1731	4525	1216	310	84	33	16	6	5	4	1	1									8010	6.49	.09	25	49	26
II		58	1378	3458	1454	462	165	54	25	14	8	4										7080	7.61	.27	23	41	35
III		1	67	1234	3206	1510	647	257	123	47	22	5	3		2	1						7125	8.71	.40	21	37	32
IV			1	94	1181	2911	1528	758	315	127	57	25	2	1		1						7001	9.76	.51	21	34	45
V				9	92	1005	2655	1602	848	417	177	78	16	3	1							6903	10.88	.66	19	32	49
VI					3	87	983	2324	1473	819	405	147	22	3								6266	11.89	.62	20	30	50
VII						5	73	933	2247	1398	813	343	67	13	1							5893	12.86	.56	20	31	49
VIII							7	100	976	1985	1280	554	154	28	6		2					5092	13.74	.37	24	31	44
IX								8	130	685	1282	763	301	104	23	10	2	1		1		3310	14.65	.27	27	30	43
X									7	94	515	967	539	193	63	12	4					2394	15.60	.19	29	32	40
XI										14	75	419	686	358	131	25	7		1			1716	16.51	.07	33	31	36
XII									1		8	66	316	539	248	58	11	2	1		1	1251	17.43	—.04	36	33	30
Total	78	1790	5971	6011	6246	6064	6091	6052	6151	5605	4646	3372	2107	1242	475	107	26	3	2	1	1	62041		.43	23	36	42
Average Grade	1.00	1.03	1.25	2.04	2.89	3.75	4.62	5.50	6.43	7.24	8.00	8.95	10.14	10.97	11.20	11.10	10.89	11.00	11.50	9.00	12.00						

or accelerated. There are 78 + 1731 or 1809 such pupils. Those who are six years old are at-age, and those whose ages are greater than six, that is seven or more, are over-age or retarded. In computing the average over-ageness for a given grade, the average age of all pupils in this grade is first obtained. The difference between this average age and the standard age for the grade gives the average over-ageness, which is expressed in terms of years. For example, an average over-ageness of .39 means that the average age of the pupils of a given grade is .39 of a year greater than the standard age for that grade. In making this computation the mid-point of the age interval for a grade is taken as the standard age. Thus in systems having semi-annual promotions the standard age for Grade I B is 6.25 years; in systems having annual promotions the standard average age for the first grade is 6.50 years. The over-ageness for a school system or group of school systems is the weighted average of the over-ageness for the various grades.

On the lowest line of the table the average grade is given for each age-group. It is one more than the average number of years of progress. For example, the nine-year old pupils have an average grade of 3.75. This means that on the average these pupils are three-fourths of the way through the third grade or have made 2.75 years of progress. It will be noted that up to and including the eighteen-year old group the pupils in each age-group have a higher average grade than those in any lower age-group.

General age-grade indices for Illinois schools. For all of the town and city elementary schools included in this study the average over-ageness is .45 year, for all rural elementary schools .15 year and for all high schools .33 year. For all city schools, that is, elementary and high schools combined, the average over-ageness is .43 year. Their percent of pupils under-age is 23, of those at-age, 36 and of those over-age, 42. For rural schools the percents are 29, 42 and 29 respectively. The median age of entrance is about six and one-third years in city schools, and a tenth of a year less in rural schools. The quartile deviation in each case is slightly over one-half year. Entrants to high school average almost fourteen and one-half years of age with a quartile deviation of two-thirds of a year.

Age-grade indices for elementary schools. In Tables XIV and XV the age-grade indices are given for the elementary schools which cooperated in this investigation. The schools are grouped

TABLE XIV. - AGE-GRADE INDICES FOR ELEMENTARY SCHOOLS HAVING SEMESTER PROMOTIONS

City Number	Average Over-ageness	Percent			Age at Entrance	
		Under Age	At Age	Over Age	Median	Quartile Deviation
Class I						
9	.42	26	29	46	6.16	.32
10	.40	24	26	45	6.41	.55
37	.39	21	32	46	6.31	.41
92	.16	32	31	37	6.19	.36
All	.41	24	30	46	6.25	.41
Class II						
12	.48	22	30	48	6.22	.40
13	.39	26	25	49	6.32	.42
39	.48	23	19	48	6.06	.39
46	.77	17	25	58	6.16	.44
84	.62	23	27	50	6.05	.38
All	.58	21	28	51	6.23	.41
Class III						
1	.48	25	27	48	6.27	.37
22	.51	23	27	50	6.17	.40
25	.26	33	27	40	6.03	.37
33	1.02	13	25	62	6.25	.44
42	.38	20	38	42	6.16	.32
44	.26	31	28	41	6.16	.38
49	1.01	9	22	68	6.27	.15
54	.09	38	30	32	6.18	.33
65	.47	29	24	48	6.09	.42
79	.55	22	26	51	6.13	.50
All	.54	24	27	49	6.17	.40
Class IV						
4	.16	42	20	38	6.08	.39
18	.14	40	29	32	6.11	.33
35	.88	12	25	63	6.38	.51
59	.38	24	34	42	6.24	.32
All	.43	28	27	45	6.19	.40
All Semester	.53	23	27	50	6.18	.41
All Sem. and Ann.	.45	22	36	42	6.31	.53

as in the corresponding tables of Chapter II. In addition to the four age-grade indices, these tables include the median age at entrance and the quartile deviation from this median age. The quartile deviation means that approximately one-half of the pupils are included within a range of that distance on either side of the

TABLE XV. AGE-GRADE INDICES FOR ELEMENTARY SCHOOLS HAVING ANNUAL PROMOTIONS

City Number	Average Over-ageness	Percent			Age at Entrance	
		Under-Age	At-Age	Over-Age	Median	Quartile Deviation
Class II						
51	.62	17	37	46	6.44	.54
58	.30	22	44	34	6.27	.52
60	.55	17	39	44	6.33	.52
All	.49	19	40	41	6.36	.53
Class III						
5	.34	30	36	34	6.06	.57
15	.22	27	43	30	6.22	.70
29	.29	19	49	31	6.47	.41
31	.06	26	50	24	6.43	.42
40	.53	17	41	41	6.41	.37
41	.23	20	53	27	6.30	.54
45	.01	25	56	19	6.34	.40
47	.57	15	45	40	6.39	.42
48	.10	26	48	27	6.32	.52
52	.15	27	41	32	6.05	.53
53	.49	19	42	40	6.36	.44
62	.42	19	43	39	6.48	.59
66	1.04	8	30	62	6.67	.43
67	.50	22	38	40	6.30	.57
70	.26	20	50	30	6.39	.43
71	.59	22	37	42	6.31	.61
75	.16	22	53	25	6.34	.43
76	.03	24	56	19	6.31	.43
82	.25	20	48	32	6.40	.41
85	.42	21	40	39	6.31	.45
All	.40	21	43	36	6.36	.50
Class IV						
2	.42	15	48	37	6.37	.43
6	.30	24	43	33	6.41	.45
7	.58	12	48	40	6.47	.38
8	.21	22	50	29	6.33	.50
11	.34	16	51	32	6.36	.52
14	.35	32	34	34	6.13	.30
17	.36	23	39	37	6.31	.54
19	.26	20	48	32	6.27	.52
20	.70	15	38	47	6.41	.54
21	.61	14	48	39	6.29	.44
23	.32	24	42	34	6.43	.46
24	.54	16	43	41	6.38	.43
26	.51	18	43	39	6.30	.53
27	.27	25	43	32	6.23	.51
28	.45	16	46	38	6.44	.43
30	—.03	28	52	20	6.20	.53
34	.08	26	54	21	6.22	.50
38	.38	18	43	38	6.24	.57
43	.26	25	43	32	6.29	.53
50	.05	25	53	22	6.27	.48
55	.17	20	52	28	6.35	.46
56	.17	29	41	30	6.34	.47
57	.14	24	49	27	6.35	.41
61	.31	25	41	35	6.34	.51
63	.29	15	56	29	6.37	.38
64	.41	17	46	37	6.30	.54
68	.24	18	55	27	6.40	.39
69	.38	18	46	36	6.38	.41
72	.12	28	47	25	6.22	.53
73	.36	19	44	38	6.35	.45
74	.18	25	48	27	6.14	.52
77	.27	25	41	34	6.34	.51
80	.33	17	54	29	6.34	.51
81	.48	19	44	37	6.31	.47
83	.26	15	59	26	6.42	.37
86	.35	21	44	35	6.28	.51
88	.65	12	40	48	6.43	.21
All	.32	21	46	33	6.32	.49
All Annual	.39	21	43	36	6.35	.50
All Ann. and Sem.	.45	22	36	42	6.31	.53
Rural						
1	—.09	34	47	19	6.15	.55
2	.26	26	41	33	6.24	.54
3	.20	28	40	32	6.26	.58
4	.65	28	35	37	6.48	.49
All	.15	29	42	29	6.23	.56

TABLE XVI. AGE-GRADE INDICES FOR HIGH SCHOOLS HAVING SEMESTER PROMOTIONS

City Number	Average Over-ageness	Percent			Age at Entrance			
					Elementary		High School	
		Under Age	At Age	Over Age	Median	Quartile Deviation	Median	Quartile Deviation
Class A								
9	.24	33	23	44	6.21	.40	14.33	.63
39	.12	37	24	39	6.22	.45	14.30	.55
78	—.09	45	22	32	....	...	14.14	.53
All	.07	40	23	38	6.21	.41	14.24	.56
Class B								
5	.77	20	19	61	....	...	14.78	.81
25	.31	29	22	49	5.95	.21	14.39	.59
51	.62	22	16	62	6.64	.57	14.82	.67
65	.30	32	20	48	6.15	.39	14.31	.65
84	.27	29	25	46	....	...	14.28	.61
All	.43	27	21	52	6.23	.47	14.39	.67
Class C								
4	.46	29	15	55	6.23	.51	14.21	.52
18	.63	19	28	53	6.31	.31	14.52	.49
32	.07	35	29	36	6.26	.31	14.22	.49
59	.23	24	38	38	6.31	.31	14.34	.38
86	.33	33	19	48	6.24	.40	14.46	.62
All	.30	29	27	44	6.25	.45	14.35	.50
All Semester	.24	34	23	44	6.22	.52	14.33	.59
All Sem. and Ann.	.28	30	31	39	6.36	.55	14.45	.67

median. Thus a quartile deviation of .45 with a median age of 6.50 means that approximately one-half of the pupils entered between the ages of 6.05 and 6.95.

An examination of these tables reveals much the same variations as were noted for indices of progress in the corresponding tables of Chapter II. In the elementary schools of one system the average over-ageness is —.03. The interpretation of this fact is that on the average the pupils are slightly younger than the standard age. There are other systems in which the average over-ageness is relatively small. At the other extreme we find systems in which the average over-ageness exceeds one year. The percent of pupils under-age or accelerated ranges from 8 to 42 and the percent of those over-age or retarded from 19 to 68. The lowest median age of entrance is 6.03 and the highest 6.48, which indicates a lack of uniformity with reference to age of children entering school.

Age-grade indices for high schools. In Tables XVI and XVII the age-grade indices are given for the high schools cooperating in this investigation. In addition to the four indices of over-ageness, the

TABLE XVII. AGE-GRADE INDICES FOR HIGH SCHOOLS HAVING ANNUAL PROMOTIONS

City Number	Average Over-ageness	Percent			Age of Entrance			
					Elementary		High School	
		Under Age	At Age	Over Age	Median	Quartile Deviation	Median	Quartile Deviation
Class B								
13	—.53	54	30	16	6.23	.32	13.85	.71
36	.61	15	34	51	....	....	14.92	.75
53	.32	23	38	39	6.58	.59	14.68	.75
All	.14	30	34	36	6.42	.47	14.51	.82
Class C								
2	.24	21	42	36	6.45	.56	14.60	.71
6	.16	28	38	34	6.12	.54	14.49	.63
8	.34	22	37	41	....	....	14.79	.77
15	.14	29	31	39	6.29	.49	14.44	.65
16	.31	28	33	39	6.16	.62	14.68	.85
20	.46	17	44	39	6.40	.57	14.70	.67
23	.25	22	47	31	6.33	.47	14.61	.62
34	.49	13	47	40	6.45	.45	14.55	.57
41	.30	19	43	38	6.48	.51	14.73	.65
43	—.06	35	39	27	6.26	.59	14.39	.68
47	.03	31	37	32	6.20	.57	14.36	.67
52	—.45	59	22	19	....	....	13.75	.64
68	.08	25	43	32	6.34	.59	14.55	.60
70	.10	31	40	29	....	....	14.23	.68
74	.04	33	34	33	6.00	.55	14.34	.68
76	.16	24	47	29	6.25	.48	14.48	.52
77	.34	22	36	41	6.89	.62	14.73	.75
79	.10	32	38	30	....	....	14.38	.73
82	.01	27	49	24	....	....	14.44	.55
All	.17	27	40	33	6.33	.56	14.49	.68
Class D								
3	.08	28	50	22	6.36	.46	14.46	.55
21	.39	14	39	47	6.44	.38	14.83	.65
27	.37	23	30	47	6.25	.51	14.66	.70
28	.22	18	47	35	6.45	.44	14.65	.57
50	.04	21	57	21	6.40	.27	14.51	.44
55	.09	27	47	26	6.18	.52	14.43	.65
61	.47	17	42	41	6.40	.37	14.69	.66
64	.45	18	36	45	6.50	.44	14.91	.72
83	—.09	31	47	22	6.45	.33	14.37	.52
90	.32	17	49	34	....	....	14.66	.51
91	.43	12	45	43	6.30	.45	14.65	.56
All	.27	21	44	35	6.37	.49	14.58	.60
Class E								
38	.46	14	50	36	6.44	.41	14.55	.81
69	—.03	27	55	18	6.40	.46	14.38	.54
87	.38	13	38	50	....	....	15.00	.59
88	.35	17	43	39	6.00	1.00	14.50	.42
89	.42	21	46	46	6.70	.39	15.00	.81
All	.28	20	46	34	6.40	.57	14.64	.74
All Annual	.33	26	40	34	6.40	.51	14.52	.70
All Ann. and Sem.	.28	30	31	39	6.36	.55	14.45	.67

median age of entrance to both elementary and high school is given. It will be noted that the variations in the age at entrance to high school, 13.75 to 15 years, are greater than in elementary school. This is to be expected because the age of entrance to high school is influenced both by age in the elementary school and by the policy

of promotion practiced. The variations in the age-grade indices are also significant.

Influence of size of city and frequency of promotion upon age-grade indices. A comparison of Tables XIV and XV shows that the average over-ageness and the percents of pupils over-age and under-age are larger for schools having semester promotions. This is probably due to the greater flexibility of the semi-annual plan of promotion. A similar condition exists in the case of high schools for the percent of pupils under-age and the percent over-age. A comparison of the age-grade indices for the different classes of schools does not indicate that the size of the school system is a potent factor in determining the magnitude of these indices. Neither is it apparent that the size of the city has any effect upon the ages at which pupils enter school. In the case of high schools there is a slight tendency for the age of entrance to be greater in the small systems.

CHAPTER IV

THE RELIABILITY OF AGE-GRADE INDICES AS MEASURES OF THE PROGRESS OF CHILDREN THROUGH A SCHOOL SYSTEM

Major problem of this study. As stated on page 9 the major problem of this study is to determine the reliability or accuracy of age-grade indices as measures of the progress of pupils through a school system. Before discussing this question, two of the minor problems[1] have been presented in the preceding chapters in order that the reader might be acquainted with the various indices. Age-grade indices are more easily calculated and more generally used than indices of progress, but are influenced by age at entrance which, as we have shown, varies widely between systems as well as for individual pupils within a given system. Age-grade indices are also affected by time out of school, but this applies only to a limited number of pupils. The major problem of this study may be restated as follows: Is the influence of variation in age at entrance and time out of school sufficient to limit seriously the usefulness of age-grade indices as measures of progress?

Method of determining reliability of age-grade indices. The indices of progress summarize the actual facts in regard to the progress of children through the school system. Hence, they may be accepted as valid or truthful measures of conditions existing and may be used as criteria for judging the reliability or accuracy of age-grade indices as measures of progress. In Tables XVIII to XXII, the corresponding indices of progress and age-grade indices for the various school systems are brought into juxtaposition. These items have been taken from the tables given in Chapters II and III.

Comparison of average over-ageness with average progress in elementary schools. In Table XVIII, the average over-ageness and the average progress are given for the various elementary school systems. The cities have been ranked according to average progress, beginning with city number 21, for which it is .79. An examination of the table shows that there is some tendency for a high over-age-

[1] See page 9.

TABLE XVIII. AVERAGE PROGRESS COMPARED WITH AVERAGE OVER-AGENESS IN ELEMENTARY SCHOOLS

City Number	Average Progress	Average Over-ageness	City Number	Average Progress	Average Over-ageness
21	.79	.61	72	.90	.12
66	.80	1.04	61	.90	.31
49	.81	1.01	55	.90	.17
81	.82	.48	14	.90	.35
27	.83	.27	79	.90	.55
26	.83	.51	1	.90	.48
67	.83	.50	34	.91	.08
74	.84	.18	23	.91	.32
38	.84	.38	11	.91	.34
24	.84	.54	8	.91	.21
53	.84	.49	41	.91	.23
33	.84	1.02	29	.91	.29
46	.84	.77	15	.91	.22
64	.85	.41	5	.91	.34
20	.85	.70	35	.91	.88
71	.85	.59	65	.91	.47
40	.85	.53	25	.91	.26
60	.85	.55	28	.92	.45
51	.85	.62	75	.92	.16
88	.86	.65	70	.92	.26
43	.86	.26	12	.92	.48
85	.86	.42	68	.93	.24
52	.86	.15	56	.93	.17
47	.86	.57	6	.93	.30
84	.86	.62	45	.93	.01
63	.87	.29	44	.93	.26
19	.87	.26	22	.93	.51
7	.87	.58	48	.94	.10
58	.87	.30	59	.94	.38
86	.88	.35	37	.94	.39
80	.88	.33	10	.94	.40
73	.88	.36	30	.95	—.03
2	.88	.42	42	.95	.38
82	.88	.25	13	.95	.39
69	.89	.38	50	.96	.05
57	.89	.14	76	.96	.03
17	.89	.36	31	.96	.06
62	.89	.42	92	.96	.16
39	.89	.48	9	.96	.42
83	.90	.3	54	.98	.09
77	.90	.27	18	.98	.14
			4	.99	.16

ness to be paired with a low average progress and a low over-ageness with a high average progress. This is merely what we should expect, namely, that those school systems which have a high average progress will also have a low over-ageness. However, the significant feature of Table XVIII is the departure from perfect

correlation. There is by no means a regular decrease in the average over-ageness as we go down the column and if we consider systems having approximately the same average progress we find widely different degrees of over-ageness. For example, in the six systems having an average progress of .84, the average over-ageness ranges from .18 to 1.02. A similar lack of agreement is shown by the cities having an average progress of .91, in which the amount of average over-ageness varies from .08 to .88. The lack of correlation may also be shown in systems which have the same average over-ageness: in four systems with an average over-ageness of .38, the average progress is .84, .89, .94 and .95; in two systems with an average over-ageness of .51, the average progress is .83 and .93.

The coefficient of correlation between these two indices is .62, which according to some standards might be interpreted as indicating a fair degree of correlation. However, it is obvious from the illustrations cited in the preceding paragraph that the relationship between these two measures of progress is not close. "Average progress" is an expression of the actual rate at which children progress through a school system. Hence the "average over-ageness" will not in general truthfully indicate the existing conditions and should not be used as a measure of a school system whenever it is possible to calculate the "average progress."

Comparison of percent fast and percent under-age in elementary schools. In Table XIX, the percent of pupils making fast progress and the percent that are under-age for their grade are given. As in Table XVIII, the departures from perfect correlation are conspicuous. For example, if we take those systems in which 1 percent of the pupils have made fast progress we find that the percent who are under-age varies from 8 to 28. The coefficient of correlation between these two types of indices is .38.

Comparison of percent slow and percent over-age in elementary schools. Table XX presents the percent of pupils making slow progress and the percent of those who are over-age for their grade. The departure from perfect correlation is somewhat greater in this table than in the preceding one. The coefficient of correlation is .28.

Comparison of average progress and average over-ageness in high schools. Table XXI gives the average progress and the average over-ageness for the high schools which cooperated in this investigation. The agreement between the two indices is much less than that shown by Table XVIII for the corresponding indices of elementary

TABLE XIX. PERCENT OF PUPILS MAKING FAST PROGRESS COMPARED WITH PERCENT OF PUPILS UNDER-AGE IN ELEMENTARY SCHOOLS

City Number	Percent Fast	Percent Under-age	City Number	Percent Fast	Percent Under-age
2	0	15	8	2	22
20	0	15	19	2	20
27	0	25	26	2	18
28	0	16	38	2	18
72	0	28	55	2	20
81	0	19	61	2	25
88	0	12	29	3	19
75	.2	22	11	3	16
24	.4	16	68	3	18
57	.4	24	74	3	25
51	1	17	33	3	13
15	1	27	40	4	17
31	1	26	62	4	9
47	1	15	6	4	24
48	1	26	46	4	17
66	1	8	84	4	23
67	1	22	49	4	9
71	1	22	35	4	12
76	1	24	41	5	20
82	1	20	50	5	25
85	1	21	25	5	33
17	1	23	56	6	29
21	1	14	37	6	21
30	1	28	52	7	27
34	1	26	39	7	23
43	1	25	1	7	25
63	1	15	44	7	31
64	1	17	65	7	29
69	1	18	42	8	20
73	1	19	14	9	32
77	1	25	12	9	22
80	1	17	22	9	23
83	1	15	10	10	24
86	1	21	92	10	32
59	1	24	79	10	22
58	2	22	18	11	40
60	2	17	13	16	26
5	2	30	9	17	26
45	2	25	54	22	38
53	2	19	4	25	42
70	2	20	23	44	24
7	2	12			

TABLE XX. PERCENT OF PUPILS MAKING SLOW PROGRESS COMPARED WITH PERCENT OF PUPILS OVER-AGE IN ELEMENTARY SCHOOLS

City Number	Percent Slow	Percent Over-age	City Number	Percent Slow	Percent Over-age
31	9	24	73	28	38
30	13	20	7	29	40
45	14	19	63	29	29
76	14	19	86	29	35
48	15	27	22	29	50
50	15	22	58	30	34
59	17	42	47	30	40
57	18	27	60	31	44
54	18	32	41	31	27
5	19	34	43	31	32
29	19	31	80	31	29
6	19	33	1	31	48
55	19	28	25	31	40
68	19	27	55	31	63
18	19	32	71	32	42
75	20	25	17	32	37
72	20	25	19	32	32
70	21	30	12	32	48
23	21	34	65	32	48
11	22	32	40	33	41
56	22	30	53	33	40
10	22	45	67	33	40
15	23	30	38	33	38
34	23	21	51	34	46
42	23	42	24	34	41
44	23	41	27	35	32
62	24	39	64	35	37
77	24	34	81	35	37
37	24	46	88	37	48
92	24	37	85	38	39
8	25	29	20	38	47
61	25	35	66	39	62
9	25	46	74	39	27
4	25	38	26	40	39
82	26	32	84	41	50
14	26	34	79	42	51
69	26	36	52	44	32
2	27	37	21	44	39
28	27	38	46	44	58
83	27	26	39	46	48
13	27	49	33	46	62
			49	56	68

TABLE XXI. AVERAGE PROGRESS COMPARED WITH AVERAGE OVER-AGENESS IN HIGH SCHOOLS

City Number	Average Progress	Average Over-ageness	City Number	Average Progress	Average Over-ageness
4	.73	.46	53	.94	.32
34	.74	.49	2	.94	.24
15	.79	.14	9	.94	.24
70	.80	.10	16	.95	.31
91	.82	.43	82	.95	.01
38	.83	.46	64	.95	.45
47	.84	.03	83	.95	—.09
27	.85	.37	6	.96	.16
84	.86	.27	8	.96	.34
61	.86	.47	3	.96	.08
36	.87	.61	55	.96	.09
74	.87	.04	5	.96	.77
79	.87	.10	23	.97	.25
88	.87	.35	69	.97	—.03
76	.89	.16	68	.98	.08
20	.91	.46	90	.98	.32
52	.91	—.45	78	.98	—.09
77	.91	.34	51	.98	.62
89	.91	.42	18	.98	.63
65	.92	.30	50	.99	.04
59	.92	.23	32	.99	.07
13	.93	—.53	86	.99	.33
41	.93	.30	21	1.00	.39
43	.93	—.06	28	1.00	.22
25	.93	.31	38	1.04	.12

schools, the coefficient of correlation being only .12. As the probable error of this coefficient is .10, it can not be said that it shows any correlation at all. Tables corresponding to XIX and XX are not given for high schools, but the correlations between the corresponding indices are so low that no relationship is indicated.

Variations in average age at entrance, potent cause of unreliability of age-grade indices. The fact that the various age-grade indices do not correlate more highly with the indices of progress is due largely to the variations in the average age of entrance in the various school systems. In calculating age-grade indices chronological age and grade location are taken as a basis (see page 31). Pupils who enter late will be over-age, unless they are allowed to skip, even though they never fail of promotion. On the other hand, pupils who enter school when younger than the normal age will be under-age provided they do not fail, even though they never skip a grade. In elementary schools, the correlation between average over-

ageness and average age at entrance is almost exactly the same as that between average over-ageness and average progress. In the case of high schools the former is considerably higher. Thus, on the whole, it is evident that age at entrance is a more potent factor than progress in determining age in grade. Time out of school also affects the age-grade indices. Hence it is apparent that we should expect age-grade indices to be reliable measures of the rate at which pupils advance through a school system.

Conclusion with reference to the use of age-grade indices. The traditional age-grade table as well as certain indices may be helpful to an administrator in the study of existing conditions or occasionally even in comparing his system with another. However, the facts presented in this chapter show very clearly that age-grade indices, though easily calculated, are very poor measures of the progress of children. The rate at which pupils progress through the grades is, in the opinion of the writer, a more significant measure of the general efficiency of a school system.

CHAPTER V

THE HOLDING POWER OF THE SCHOOL

Holding power an important index of school efficiency. If we consider the school from the standpoint of the service which it renders to the community, the extent to which it holds children in school is a significant index of its efficiency in fulfilling its social function. In Illinois, children are required to attend school until they are fourteen, and, under certain conditions, until they are sixteen. Since prior to the age of fourteen, attendance is due primarily to the compulsory attendance law, the holding power of the school does not become apparent until children have reached that age.

Method of calculating indices of holding power. "Holding power" may be defined as the quotient of the number of children above the age of fourteen actually in school divided by the number that should be in school. It is relatively easy to ascertain the number of children above the age of fourteen who are enrolled in the public schools, as it is necessary only to subtract from the total enrollment for these ages those children who do not reside within the district. The divisor is much more difficult to obtain. In the first place the census data are seldom if ever assembled so as to show the number of children belonging to each age-group, fourteen-year-old children, fifteen-year-old children, etc. Even if this information were available, the figures would need to be corrected for pupils who have completed the twelfth grade. Attendance at private and parochial schools, since it is not at all constant from community to community, would be a disturbing factor.

As it is not feasible to use the census data, it becomes necessary to estimate the number of children belonging to the various age-groups who should be in school. These estimates are based upon the number of children belonging to age-groups within the boundaries of compulsory attendance; for, unless there is a failure to enforce this law, practically all pupils of these ages are found in some school, public, private or parochial. In a particular community the number of pupils belonging to the successive age-groups varies. For example, it would not be unusual to find 117 eight-year-old children, 100 nine-year-old children, 95 ten-year-old children and 109 eleven-

year-old children. Since such variations may be relatively large in small school systems, it is necessary to base our estimates on pupils belonging to several age-groups.

Ayres[1] took the average of the number of children belonging to the age-groups from 7 to 12 inclusive as the size of the "standard age-group." Thorndike[2] appears not to have used a systematic procedure in making his estimates. For this reason it has seemed desirable to use the method proposed by Ayres. In the present study corrections based upon estimates furnished by superintendents and principals have been made for attendance at private and parochial schools. The average of the number of pupils of ages 7 to 12, which is taken as the "standard age-group," is approximately the number of pupils of each age who should be in school. No correction, however, has been made for the population factor, which includes the increase due to births and the decrease due to deaths. These changes, taken together, operate to make the size of the successive age-groups slightly smaller.

Three indices of holding power have been calculated: (I) Ratio of the average of the number of 12 and 13-year-old pupils to the standard age-group; (II) Ratio of the average of the number of 15 and 16-year-old pupils to the standard age-group; (III) Ratio of the total school enrollment to the standard age-group. The first index is essentially a measure of the enforcement of the compulsory attendance law rather than of the holding power of the school, but furnishes a partial check upon the correctness of our estimate of the standard age-group.

Indices of holding power for Illinois school systems. Our study of the holding power of Illinois school systems is restricted to those from which data were obtained for both elementary and high schools. Table XXII gives the three indices, expressed in percents; in the first division those for "single unit systems" are presented; in the second those for "whole systems not coterminous." The variations in these indices, particularly the second, suggest that they are not accurate. In four instances the ratio of the number of fifteen-sixteen-year-old children to the "standard age-group" is greater than 100, in a number of other school systems it is less than

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[1]Ayres, L. P. Laggards in Our Schools. New York: Charities Publication Committee, 1909. 236 p.

[2]Thorndike, E. L. "The elimination of pupils from school." U. S. Bureau of Education Bulletin, 1907, No. 4. Washington, 1907. 63 p.

TABLE XXII. INDICES OF THE HOLDING POWER OF THE SCHOOL SYSTEMS

A. Single Unit Systems				B. Whole Systems, Not Coterminous			
City Number	Index I	IndexII	IndexIII	City Number	Index I	IndexII	IndexIII
2	89	52	1086	4	109	65	1060
9	103	46	1049	5	99	56	1080
13	100	34	1005	6	87	58	1065
15	113	54	1074	8	97	94	1233
18	109	112	1282	20	95	76	1144
21	89	91	1130	23	96	98	1162
28	71	37	978	25	88	66	1113
39	97	57	1023	27	101	75	1256
52	95	49	1023	34	92	65	1058
55	100	48	1030	38*	98	24	896
59	116	101	1176	41	100	85	1182
65	105	68	1149	43	92	77	1159
69*	125	53	1054	47	119	61	1187
76	106	95	1223	50	116	156	1356
77	99	68	1123	51	98	33	973
86	108	97	1229	53	92	55	1054
All	101	55	1066	61	106	60	1065
				64	71	120	1233
				68	124	52	1051
				70	83	47	935
				74	83	66	1081
				79	95	40	994
				82	106	59	1036
				83	109	68	1064
				84	104	52	1063
				88*	132	42	888
				All	98	55	1056
				All Entire Systems	99	55	1062

*These systems do not have four-year high schools.

50. Certain obvious causes tend to contribute to this variability. An examination of the age-groups for individual cities reveals that there is considerable variation especially in small cities in the number of pupils belonging to these groups. Consequently, in several instances it happens that the age-groups from which the numerator of the ratio was obtained are unusually small or large, and therefore not representative of existing conditions. Attendance at private and parochial schools contributes to the variability. In the case of whole systems not coterminous, although a correction[3] was made for the

[3]This correction was based upon an estimate by the superintendent or principal.

differences in the boundaries of the two divisions of the whole system, it is not likely that this was done with a high degree of accuracy. Finally, the original data, particularly in respect to the ages of certain children, may involve errors.

The totals for the two groups are, however, representative of the general conditions of the systems from which data were obtained. If allowance is made for the population factor, it appears that practically all children of twelve and thirteen years and almost 60 percent of those of fifteen and sixteen years are in school. If we take the ratio of the total enrollment to the standard age-group, we find that the number of pupils enrolled in elementary and secondary schools is nearly eleven times that of the average of the age-groups seven to twelve.

The third index of the holding power, since it is calculated from the total residential enrollment of the school system, is less sensitive to fluctuations in the sizes of the age-groups above fourteen. It is, however, affected by the amount of retardation, which we have shown varies greatly from system to system.

Index of holding power unreliable for small school systems. Although we have no basis for comparison, as in the case of age-grade indices, it appears that the variations in the age-groups and in attendance at private and parochial schools are such disturbing factors that the indices of holding power of the schools which we have considered here are so unreliable for small school systems as to be unsatisfactory. It is possible that, because of his acquaintance with local conditions, a superintendent could calculate more accurate indices. It is believed that the ratio of the total enrollment to the standard age-group is preferable for the small school system but, since it is influenced by the amount of retardation, care should be exercised in using it as an index of holding power.

Relation of holding power to type of school system. The differences between the totals for the two types of school systems in Table XXII are too small to be significant. Two of the three indices are slightly higher for single unit systems than for whole systems not coterminous. In view of the common opinion that it is a distinct disadvantage to have the elementary school and the high school under separate control, these results are rather surprising. It appears that in systems having dual control, the holding power is about as great as in single unit systems. It is possible that there is a tendency to promote pupils more readily in case they are to enter a

TABLE XXIII. PERCENTS OF PUPILS OF EACH AGE IN ELEMENTARY AND HIGH SCHOOLS

	Age																					Total
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
(Uncorrected Figures)																						
Single Unit Systems	.3	28	98	97	107	98	100	98	102	99	92	67	42	26	9	2	.4	.1				1066
Whole Systems not Coterminous	1	34	98	99	97	98	100	99	105	92	83	66	43	27	11	2	1	.1		.1	.1	1056
All Entire Systems	1	31	98	98	102	98	100	99	104	95	87	66	43	27	10	2	1	.1		.03	.03	1062
(Corrected Figures)																						
Single Unit Systems	.3	26	95	95	105	97	100	99	104	102	95	70	44	27	10	2	.4	.1				1072
Whole Systems not Coterminous	1	33	96	98	96	98	101	101	108	96	87	70	46	29	12	2	1	.1		.1	.1	1075
All Entire Systems	1	30	95	97	100	98	100	100	106	99	90	70	45	28	11	2	1	.1		.03	.03	1073

high school under separate jurisdiction or that the high school under independent management makes a greater effort to interest pupils in attending. Another possibility is that dual school systems are found in communities which have a stronger sentiment in favor of high-school attendance.

Distribution of pupils by ages. In Table XXIII, the percents of pupils of each age for all single unit systems, all whole systems not coterminous, and all entire systems, may be found. The first half of the table gives the uncorrected figures; that is, the figures for the pupils actually found in school; the second half gives the figures corrected to allow for the factor of population. It will be seen that the size of the age-groups from 6 up to and including 12 is very nearly constant but that beginning with 13 there is a decrease. A marked break is noticeable between the ages of 14 and 15, at which more than one-fourth of the fourteen-year-old pupils appear to drop out of school. Only about two-thirds of the fifteen-year-old children are in school, less than one-half of the sixteen-year-old, slightly over one-fourth of the seventeen-year-old and one-tenth of the eighteen-year-old children. By the age of twenty, one in a hundred is to be found in school, and above that age only a small fraction of one percent. In our interpretation of this table, however, it must be remembered that those students who have completed high school and are attending higher institutions are not included in these figures.

Distribution of pupils in the several grades. With a standard age-group of 100 as a basis, the number of pupils to be found in each grade has been calculated from the data. The figures given below, which should be read as percents of the standard age-group, include attendance in public, private and parochial schools. Those in the first row are for pupils actually found in school, and those in the second are corrected for the population factor. The effect of re-

	Grade											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Uncorrected.....	123	110	111	108	107	97	91	79	86	63	45	31
Corrected.....	124	112	114	112	112	102	97	85	93	69	49	34

tardation is such that below the sixth grade the number of pupils enrolled in school is greater than the standard age-group. Beginning with the sixth grade the effect of elimination is noticeable. The number of pupils enrolled in the twelfth grade is approximately one-third of the standard age group.

CHAPTER VI

THE PERMANENCE OF THE SCHOOL POPULATION

The permanence of the school population in the elementary school. The data collected in this investigation make it possible to identify those pupils who have spent their entire school careers in the school system in which they were enrolled in September, 1922. A measure of the permanence of the school population has been obtained by calculating the percent of pupils in the highest grade of both elementary and high school who have spent their entire school careers in the same system. These percents for elementary school systems having semester promotions are given in Table XXIV; for systems having annual promotions, in Table XXV. The

TABLE XXIV. PERCENT OF PUPILS IN THE HIGHEST GRADE OF ELEMENTARY SCHOOLS HAVING SEMESTER PROMOTIONS THAT HAVE SPENT THEIR WHOLE SCHOOL CAREERS IN THE SAME SCHOOL SYSTEM

City Number	Percent	City Number	Percent
Class I		Class III	
9	69.9	1	25.0
10	100.0	22	30.3
37	58.8	25	42.9
92	44.3	33	52.3
All	68.9	42	75.0
		44	64.4
		49	33.3
Class II		54	48.1
12	44.6	65	48.7
13	73.5	79	70.0
39	59.4	All	46.4
46	59.5		
84	64.7		
All	56.3	Class IV	
		4	50.0
		18	58.1
		35	12.5
		59	60.7
		All	35.0
		All Semester	52.2
		All Sem. and Ann.	56.5

TABLE XXV. PERCENT OF PUPILS IN THE HIGHEST GRADE OF ELEMENTARY SCHOOLS HAVING ANNUAL PROMOTIONS THAT HAVE SPENT THEIR WHOLE SCHOOL CAREERS IN THE SAME SCHOOL SYSTEM

City Number	Percent	City Number	Percent
Class II		Class IV—Cont.	
51	65.1	23	50.0
58	60.0	24	34.0
60	35.4	26	88.5
All	57.1	27	57.1
		28	64.5
Class III		30	75.7
5	59.6	34	73.8
15	46.3	38	37.5
29	41.1	43	62.5
31	10.8	50	58.8
40	81.3	55	47.6
41	58.0	56	62.5
45	50.0	57	52.4
47	69.0	61	50.0
48	43.4	63	47.6
52	71.4	64	81.8
53	67.2	68	80.3
62	50.0	69	75.0
66	67.1	72	62.5
67	61.0	73	54.3
70	70.2	74	69.6
71	41.2	77	52.5
75	65.1	80	62.9
76	56.9	81	69.6
82	45.5	83	72.2
85	52.2	86	56.9
All	54.5	88	42.9
		All	61.5
Class IV			
2	57.1	All Annual	57.4
6	81.1	All Ann. and Sem.	56.5
7	57.7		
8	72.2	Rural	
11	64.5	1	62.7
14	71.8	2	52.9
17	68.6	3	48.7
19	58.8	4	89.3
20	71.4	All	53.7
21	88.9		

TABLE XXVI. PERCENT OF PUPILS IN THE HIGHEST GRADE OF HIGH SCHOOLS HAVING SEMESTER PROMOTIONS THAT HAVE SPENT THEIR WHOLE HIGH-SCHOOL CAREERS IN THE SAME SCHOOL SYSTEM

City Number	Percent	City Number	Percent
Class A		Class C	
9	69.8	4	100.0
39	92.9	18	83.3
78	81.6	32	100.0
All	75.3	59	100.0
		86	80.0
		All	86.0
Class B			
5	100.0		
25	100.0	All Semester	84.4
51	100.0	All Sem. and Ann.	89.6
65	80.0		
84	100.0		
All	95.6		

variability of this index of permanence of the school population is the conspicuous feature of these tables: in some systems all of the children who were enrolled in the eighth grade in September, 1922, have spent their entire school careers in that system; on the other hand in one system less than one pupil out of every nine in the eighth grade has received all of his schooling in the system. The general tendency is for slightly more than one-half of the pupils in the eighth grade to have been in the same school system since they first entered school. The permanence of pupils in city schools is slightly greater than that in rural schools.

The permanence of the school population in high school. Tables XXVI and XXVII give the percents of pupils in the highest grade of the high school who have spent their whole high-school careers in the same system. Between one-third and one-half of the schools show 100 percent permanence; a number give an index of less than .80; the average for all schools is slightly less than .90. In no case is the index of permanence as low as in many of the elementary school systems. This difference is to be expected since the high school includes only four years as compared with eight years in the elementary school.

The permanence of school population in whole systems. In Table XXVIII the indices of permanence are given for the whole

TABLE XXVII. PERCENT OF PUPILS IN THE HIGHEST GRADE OF HIGH SCHOOLS HAVING ANNUAL PROMOTIONS THAT HAVE SPENT THEIR WHOLE HIGH-SCHOOL CAREERS IN THE SAME SCHOOL SYSTEM

City Number	Percent	City Number	Percent
Class B		Class D	
13	95.1	3	92.3
36	100.0	21	80.0
53	85.1	27	90.0
All	91.6	28	100.0
		50	90.9
Class C		55	100.0
2	85.7	61	90.0
6	94.4	64	87.5
8	100.0	83	100.0
15	84.2	90	100.0
16	96.6	91	100.0
20	90.0	All	93.8
23	91.7		
34	100.0	Class E	
41	97.8	38	83.3
43	86.4	69	100.0
47	80.0	87	100.0
52	72.7	88	85.7
68	83.3	89	100.0
70	93.9	All	95.7
74	85.0		
76	84.8	All Annual	91.8
77	100.0	All Ann. and Sem.	89.6
79	100.0		
82	96.4		
All	91.4		

systems from which data were secured. It is interesting to note that there is one system (No. 59) in which 100 percent of the pupils enrolled in the highest high-school grade have received all of their schooling in that system. There is one whole system not coterminous in which there are no pupils who began their schooling in that system. The average for all whole systems is slightly more than 50 percent.

Relation of permanence to progress. The data presented in Tables XXIV to XXVIII are in themselves of little significance with reference to the efficiency of school systems. It is, however, frequently stated that the shifting of the school population tends to interfere with the progress of the pupils. The average progress for those pupils in the eighth and twelfth grades who had been in the same

TABLE XXVIII: PERCENT OF PUPILS IN THE HIGHEST HIGH-SCHOOL GRADE THAT HAVE SPENT THEIR WHOLE SCHOOL CAREERS IN THE SAME SCHOOL SYSTEM

A. In Single Unit Systems		*B. In Whole Systems, not Coterminous*	
City Number	Percent	City Number	Percent
2	71.4	4	50.0
9	56.1	6	5.5
13	78.0	20	35.0
15	42.1	23	33.3
18	33.3	27	00.0
21	80.0	34	50.0
28	50.0	38	66.7
39	67.9	41	56.5
55	62.5	43	36.4
59	100.0	47	34.5
65	30.0	50	72.7
69	88.9	51	50.0
76	38.2	53	55.3
77	77.8	61	50.0
86	10.0	64	87.5
All	53.5	68	50.0
		74	30.0
		83	45.5
		88	28.6
		All	48.7
		All Whole Systems	51.7

school system for their entire school careers and also for those who had transferred, was computed. The results, given in Table XXIX, show a definite tendency for the pupils who move from one system to another to make less progress. It should be noted that this procedure does not take into account any loss, when transferred, due to being placed in a lower grade in the system entered.

TABLE XXIX. AVERAGE PROGRESS OF PUPILS WHO HAVE SPENT THEIR WHOLE SCHOOL CAREERS IN THE SAME SCHOOL SYSTEM AND OF THOSE WHO HAVE NOT

A. During Elementary School Career			*B. During High-School Career*			*C. During Whole School Career*		
Class	Same	Others	Class	Same	Others	Class	Same	Others
Semester Promotions			Semester Promotions			Semester Promotions		
I	.98	1.00	A	1.08	.92	A	1.04	.99
II	.98	.90	B	1.03	1.00	B	.99	1.03
III	.97	.93	C	1.10	1.00	C	1.03	1.02
IV	1.03	1.04	All	1.07	.93	All	1.04	1.02
All	.95	.93						
			Annual Promotions			Annual Promotions		
Annual Promotions			B	1.01	.79	B	1.03	.99
II	.94	.93	C	.98	.97	C	.99	1.01
III	.94	.94	D	1.00	.86	D	.98	.97
IV	.94	.92	E	.98	1.00	E	.99	.97
All	.94	.93	All	.99	.86	All	1.00	.91
All Ann. and Sem.	.94	.93	All Ann. and Sem.	1.01	.98	All Ann. and Sem.	1.01	.98
Rural	.96	.89						

CHAPTER VII

CLASS SIZE IN ELEMENTARY SCHOOLS

Source of data relative to class size. The data with reference to the progress of children in the elementary schools were collected in such a form that it was in most cases easy to determine the size of class[1] in the cities cooperating in this investigation. Usually the data for the children instructed by one teacher were reported on a separate blank. In a few instances it appeared that two or more teachers were instructing a large number of pupils, usually from 60 to 80, in one room, and these pupils were considered as forming two classes with one-half the total number assigned to each teacher. When it happened that one teacher had pupils from two or more grades, the class was assigned to that grade to which the largest number of pupils belonged. A third difficulty was encountered in systems having departmental work; most of these had "home rooms" and the number of pupils belonging to a home room was taken as the size of class; those not assigning pupils to special rooms were not included in this study of class size.

Size of class in the various grades. In Table XXX the distribution of classes with reference to size is given for the various grades. The first division of the table shows the distributions for city school systems and the second for rural schools. It will be noticed that the extreme range for city schools, from less than 10 to more than 75, is found in the first grade. The smallest range, which is from 20 or more to less than 60, is found in Grade V. The median size of class for all grades combined is 36.4, the average 36.7. The median size in the various grades differs from this only slightly, except in the case of the eighth grade which is about four smaller. In general, as would be expected, the size of class in rural schools is much smaller. Most of the rural schools from which data were secured have only one room, there being less than one in fifteen that have two or more rooms.

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[1]When a teacher had charge of a particular group of pupils, the number of children assigned to her was taken as the size of the class regardless of whether they recited in one group or were divided into two or more.

TABLE XXX. CLASS SIZE IN ELEMENTARY SCHOOLS

Grade	Class Size																Total	Median	Average
	0—	5—	10—	15—	20—	25—	30—	35—	40—	45—	50—	55—	60—	65—	70—	75—			
City Systems																			
I		1	1	5	20	42	44	59	32	22	7	5	1	2		2	243	35.7	36.1
II			1	4	18	27	42	45	40	16	7	3	3	2			208	36.3	36.6
III				1	20	31	35	43	36	21	9	4	4				204	36.7	37.0
IV		1		2	10	19	37	52	36	15	9	8	3				192	37.6	38.0
V					6	27	28	42	37	17	9	11					177	38.3	38.7
VI			1	2	10	22	39	43	35	11	6	7	1				177	36.7	37.0
VII				5	15	26	34	38	26	10	5	7	2	1			169	35.6	36.1
VIII				5	20	39	23	23	16	16	6	2		1			151	32.5	34.2
Total		2	3	24	119	233	282	345	258	128	58	47	14	6		2	1521	36.4	36.7
Rural Schools																			
I	4	14	13	9	6	4	2										52	13.1	14.3
II	1	11	10	8	9	2	2		1	1							45	15.3	16.9
III		7	14	12	7	2		1		2							45	15.6	17.4
IV		8	15	12	9		1			2							47	15.2	16.8
V	2	14	21	13	7		4										61	13.5	14.5
VI		7	8	11	5							1					32	15.5	16.1
VII	2	10	18	12	8	6	1	1			1						59	14.9	16.7
VIII	2	6	8	8	2	3		1	1								31	14.7	16.0
Total	11	77	107	85	53	17	10	3	2	5	1	1					372	14.6	16.0

Comparison with a previous study. In a previous bulletin[2] of the Bureau of Educational Research certain facts were given relative to size of class in elementary schools in 180 Illinois cities. The information was secured by addressing a questionnaire to the superintendents of schools asking for the number of classes of various sizes, and was obtained for each of three school years, 1918-19, 1919-20 and 1920-21. The median sizes of class for the three years were 41.4, 43.4 and 43.2. These are distinctly larger than found in the present study. There are certain possible explanations of this difference. In the previous study results were obtained from many large city school systems while in the present study few such systems are represented. Another explanation is that conditions with respect to size of class may have changed since the data for the preceding studies were gathered. Furthermore, it is likely that in reporting the size of class the superintendents may have failed to include certain very small classes.

In the report of the previous study there was included a summary of the opinions of superintendents of 270 cities having a population of 25,000 or more as to the size of class which they considered ideal. The central tendency of these opinions is about 32. If this may be taken as a norm the average condition in Illinois is not distinctly unsatisfactory, although there are still many classes which are too large for efficient work and some that are too small for economical instruction.

Size of class in different cities. The median size of class has been calculated for each of the cities and counties from which information was secured. These medians are presented in Tables XXXI and XXXII. It will be seen that in the case of cities the range is from 21.9 for city Number 8 to 56.5 for city Number 51. Even in cities of approximately the same population there is an astonishingly wide range in the median class size. It is likely that these variations are due to local conditions rather than to differences in the judgments of the superintendents, for the size and number of rooms available and the amount of money appropriated for teachers' salaries are probably the most potent factors in determining class size.

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[2]"Relation of size of class to school efficiency." University of Illinois Bulletin, Vol. 19, No. 45, Bureau of Educational Research Bulletin No. 10. Urbana: University of Illinois, 1922.

TABLE XXXI. CLASS SIZE DATA FOR ELEMENTARY SCHOOLS HAVING SEMESTER PROMOTIONS

City Number	Median	City Number	Median
Class I		Class III	
9	36.3	1	27.9
10	32.3	22	39.4
37	36.0	25	37.5
92	30.1	33	47.3
All	35.1	42	26.7
		44	27.5
		49	26.9
		54	30.6
Class II		65	30.4
12	36.7	79	37.5
13	36.7	All	33.1
39	39.3		
46	44.6	Class IV	
84	36.6	4	40.6
All	38.2	18	37.5
		35	29.5
		59	30.0
		All	33.3
		All Semester	35.9
		All Sem. and Ann.	36.4

The quartile deviations and the total ranges of class size for all cities have also been computed but are not presented in this report. They show that in many cities the range in size is almost as great as that found between different cities. In only three cities is the total range of class size less than 10, in over one-tenth of the whole number it is 40 or more. In a few cities the quartile deviations are less than 2.5, which means that one-half of the classes do not differ from each other in size by more than 5. On the other hand there are some cities in which a range of more than 20 is required to include the middle one-half of the classes. The fact that such variations are found within a single system supports the conclusion advanced above that class size is chiefly determined by other factors than the opinion of the superintendent.

The relationship between class size and frequency of promotion and size of system. In systems which have annual promotions there is a tendency for the median class size to increase with the

TABLE XXXII. CLASS SIZE DATA FOR ELEMENTARY SCHOOLS HAVING ANNUAL PROMOTIONS

City Number	Median	City Number	Median
Class II		Class IV (Cont.)	
51	56.5	23	22.5
58	38.2	24	42.5
60	38.6	26	30.0
All	41.0	27	26.3
		28	33.8
Class III		30	30.0
5	36.3	34	29.0
15	27.9	38	32.8
29	40.3	43	35.0
31	38.9	50	27.5
40	34.2	55	32.5
41	39.2	56	42.5
45	32.5	57	27.5
47	37.5	61	36.9
48	35.0	63	22.5
52	31.7	64	31.3
53	33.6	68	38.8
62	48.2	69	52.5
66	41.1	72	25.0
67	48.4	73	35.0
70	29.2	74	32.5
71	44.2	77	43.0
75	34.3	80	36.7
76	29.4	81	31.9
82	35.8	83	41.3
85	39.0	86	32.5
All	37.6	88	22.5
		All	33.1
Class IV		All Annual	36.9
2	23.8	All Ann. and Sem.	36.4
6	33.8		
7	32.5		
8	21.9	Rural	
11	38.8	1	12.7
14	39.0	2	15.2
17	37.5	3	16.6
19	28.0	4	19.5
20	31.3	All	14.6
21	25.0		

total enrollment. This, however, is not shown by those having semester promotions so that on the whole it can not be said that there is any relationship between size of class and size of system. Neither does it appear that there is any relationship between the frequency of promotion and the median class size.

CHAPTER VIII

THE EFFECT OF DEPARTMENTAL WORK IN THE UPPER GRADES UPON PROGRESS

The data secured with reference to departmental organization. Among the questions asked in the supplementary questionnaire addressed to the superintendents were the following: "Is the work of the upper grades organized departmentally? If so, what grades are included?" The replies show that the departmental plan of organization prevails in forty-eight of the eighty-two elementary school systems from which responses were secured. Since no details were asked except what grades were included, it is likely that in many cities for which a departmental organization was indicated, it applies only to certain buildings or perhaps to certain subjects. In other school systems the work is as fully departmentalized as in high school. The forty-eight systems are distributed as shown below.

Class	*Number of Systems*		*Percent of Systems*	
	Semester	*Annual*	*Semester*	*Annual*
I	2	..	67	..
II	3	0	60	0
III	7	18	70	90
IV	2	16	50	44
All	14	34	64	58

The last two columns given above show the percent of schools in each class that have departmental work. For example, in Class III 70 percent of the schools having semester promotions and 90 percent of those having annual promotions have departmental organization. These percents do not indicate, as we might expect, that departmental work is much more prevalent in large school systems than in small ones, but the number of large school systems is so small that the figures may not be representative of general conditions. Of the forty-eight systems, twenty-five reported a departmental organization in Grades VII and VIII, thirteen in Grades VI to VIII and ten in Grades V to VIII. In addition to these, two failed to specify the grades in which this type of organization was used.

TABLE XXXIII. A COMPARISON OF PROGRESS IN ELEMENTARY SCHOOLS THAT HAVE DEPARTMENTAL WORK IN THE UPPER GRADES AND IN THOSE THAT DO NOT

	Average Progress	Percent		
		Fast	Reg.	Slow
Semester promotions				
Departmental	.91	9	58	33
Non-Departmental	.91	7	58	36
Annual promotions				
Departmental	.88	2	72	26
Non-departmental	.88	2	68	30
All				
Departmental	.89	5	66	29
Non-Departmental	.89	4	63	33

TABLE XXXIV. A COMPARISON OF PROGRESS IN HIGH SCHOOLS THAT HAVE DEPARTMENTAL WORK IN THE UPPER ELEMENTARY GRADES AND IN THOSE THAT DO NOT

	Average Progress	Percent		
		Fast	Reg.	Slow
Semester promotions				
Departmental	.98	11	75	13
Non-Departmental	.91	3	78	19
Annual promotions				
Departmental	.89	1	88	12
Non-Departmental	.92	.3	91	9
All				
Departmental	.94	6	81	13
Non-Departmental	.91	1	86	13

Relation of departmental organization to progress in elementary schools. The indices of progress for the two types of elementary schools given in Table XXXIII are so nearly the same that one is not justified in concluding that the departmental organization for instruction affects the progress of pupils. However, since the index

of progress is calculated from the records of pupils in all grades, it is not very sensitive to changes in the organization in only the upper grades. Thus the facts presented here should not be accepted as a conclusive answer to the question of the value of departmentalized instruction. In Table XXXIV indices of progress are given for high schools which receive pupils from departmentally organized elementary schools and for those which do not. In the case of school systems having semester promotions, the average progress in high school is much greater for pupils coming from departmentally organized upper grades. The opposite is true, though not so markedly, in the case of high schools having annual promotions. For all high schools there is a small difference in favor of departmental organization but not enough to warrant the assertion that departmental work in the elementary schools does result in more rapid progress in high school. It should be noted, however, that progress is only one of the many criteria by which departmental work should be judged.

CHAPTER IX

THE DISTRIBUTION OF ONE THOUSAND CHILDREN AT EACH AGE

Method of computing figures presented in this chapter. Although practically all of the facts in this chapter can be obtained from data previously presented, they are given here in a different form. In Table XXXV is presented a distribution of 1000 children of each age, showing how many may be found in each grade of the public schools, how many in private and parochial schools and how many are unaccounted for. The figures given are based on the assumption that the average of the number of 7 to 12-year-old children represents the normal number of children belonging to each age-group.[1] In making the correction for the population factor the writer has assumed as the rate of increase from year to year the geometric mean of the increase of the whole state except Chicago from 1910 to 1920 as shown by the census.

Data as to number of pupils of each age. The figures given in the table are to be interpreted as follows, using age six as an example. Of every 1000 children of age six, 600 are in Grade I, 183 in Grade II, 9 in Grade III, less than one in Grade IV, making a total of 792 in the public schools, 166 are enrolled in private and parochial schools and 42 are unaccounted for. This last term, when used at the lower ages, indicates that pupils are merely out of school, whereas at the upper ages it probably means that they are at work. It will be seen that from the age of six up to and including fourteen, 95 percent or more of the children appear to be in school. The number in public schools varies from 792 to 875 out of every 1000, that in the parochial schools from 76 to 198 and the number unaccounted for from 0 to 56. Above fourteen years, however, the decrease in the number in school and the increase in the number unaccounted for is very rapid. At the next age, that of fifteen, less than four-fifths are in school, at sixteen about five-ninths, at seventeen only one-third, at eighteen about one-eighth, until finally at twenty-one only one-tenth of one percent of the children are in school.

[1] (See p. 47)

TABLE XXXV. CORRECTED DISTRIBUTION OF ONE THOUSAND CHILDREN OF EACH AGE

Grade	Age																				Total in School	In Priv. and Par. Schools	Grand Total
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
1	10	227	600	163	42	12	5	2	1	1	1	—*	—									1064	219	1283
2		8	183	463	197	63	23	8	4	2	1	1										953	198	1151
3		—	9	165	433	205	89	36	17	7	3	1	—		—	—						965	193	1158
4			—	13	159	397	210	106	44	18	8	4	—	—		—						959	169	1128
5				1	13	137	365	222	119	59	26	11	2	—	—							955	150	1105
6					—	12	135	323	206	116	57	21	3	—								873	126	999
7						1	10	129	315	198	116	49	10	2	—							830	106	936
8							1	14	136	281	183	80	23	4	1		—					723	96	819
9								2	31	165	311	187	74	26	5	3	1	—		—		805	71	876
10									2	23	124	236	133	48	16	3	1					586	63	649
11										3	18	103	170	89	34	7	2		—			426	45	471
12											2	16	78	134	62	15	3	11	—		—	311	34	345
Total in School	10	235	792	805	844	827	838	842	875	873	850	709	493	303	118	28	7	11	—	—	—	9450	1470	10920
In Priv. and Par. Schs.**	1	50	166	161	198	141	135	137	134	76	94	75	55	31	12	3	1					1470		
Unaccounted for	989	715	42	34	***	32	27	21	***	51	56	216	452	666	870	969	992	999	1000	1000	1000	10131		

*This symbol indicates that a few cases were found here, but less than one in a thousand.
**The number in private and parochial schools represents an estimate by superintendent or principal.
***Due to the fact of irregular increase in population, incorrectly reported ages, wrong estimates of those in private and parochial schools, or other causes the total number of pupils at these ages was greater than the average of the 7 to 12-year olds.

Percents of pupils in each grade. The figures on the right-hand side of the table show similar facts by grades. Out of a population of 1000 children of each age, almost 1300 are in the first grade of either public or private and parochial schools, over 1100 are in each of Grades II to V and about 1000 in Grade VI. In other words, the effect of retardation is such that in each of the first five grades of the elementary school the enrollment is larger than the size of a year group of children. The total enrollment in these six grades is over 6800, an excess of more than 13 percent. This does not allow for the children who are not in school. From the seventh grade on the figures decrease, except that the number in the ninth grade is greater than that in the eighth, until by the twelfth only slightly more than one-third of the children are in school.

The enrollment in the different grades may also be compared with that in the first grade. If, in Grade I the number of pupils enrolled is considered as 100 percent, the number in each of the following grades may be represented by its ratio to that of the first grade. These percents are as follows, the first row being for the public schools alone and the second for all schools. On this basis it

	Grade												
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	ALL
Public Schools	100	90	91	90	90	82	78	68	75	55	40	29	888
All Schools	100	90	90	88	86	78	73	64	68	51	37	27	851

can readily be seen that the enrollment in the next few grades tends to be about nine-tenths of that in Grade I and that after the fifth grade it steadily decreases until in the twelfth it is less than three-tenths.

Significance of data presented in this chapter. Although the figures for Illinois do not compare unfavorably with those for other states, nevertheless they reveal a situation that can not be viewed with complacence. The fact that more than one out of every twenty children at the ages of thirteen and fourteen, one out of five at the age of fifteen and almost one out of two at the age of sixteen, are out of school shows a serious condition. As the number of children graduating from high school at the age of fifteen or less is so small as to be practically negligible and at sixteen only one-fourth of all, it is evident that approximately all the pupils who have dropped out have failed to complete high school. A large proportion of them

have not completed even the elementary school. The retardation in the grades presents a situation also which should cause concern. The enrollment in the first grade is 28 percent larger than any one year group, or a 28 percent retardation, that in the next four grades varies from a 10 to 15 percent retardation. The fact that Table XXXV gives a total of 876 children enrolled in the ninth grade may appear to indicate a very favorable condition, but a study of the body of the table shows that a large number of these children are over-age for this grade. Furthermore, one should note that less than 40 percent of those who enter high school survive to become seniors, some of whom are not graduated.

APPENDIX A

The Forms Used in Collecting Data

Immediately below is a reproduction of the "questionnaire supplementary to progress record" which was filled out by the superintendent or principal of each school that contributed data. Following this is a copy of the progress record itself. First, the instructions to teachers for filling out the progress record are given and after these the headings which show the items of information desired, followed by a portion of the blank.

University of Illinois
College of Education
Bureau of Educational Research

QUESTIONNAIRE SUPPLEMENTARY TO PROGRESS RECORD

City.....Supt. or Prin.....

1. Do you have annual, semi-annual, or some other system of promotion?.....
2. Are the boundaries of your elementary school district the same as those of the high school district?.....If not, approximately what percent of non-tuition high-school pupils come from without the elementary district?.....
3. Are the city limits the same as the boundaries of the elementary school district?.....If not, approximately what percent of non-tuition elementary school pupils come from without the city limits?.....
4. Are the city limits the same as the boundaries of the high-school district?.....If not, approximately what percent of non-tuition high-school pupils come from without the city limits?.....
5. Approximately how many children who would otherwise attend the elementary schools attend parochial or private schools?.....
   What grades do these schools include?.....
6. Approximately how many children who would otherwise attend high school attend parochial or private schools?.....What grades do these schools include?.....
7. Do you have kindergarten or sub-primary classes?.....If so, what is the approximate enrollment therein by ages? 4 years....., 5 years....., 6 years....., other ages.....
8. Is the work of the upper grades organized departmentally?.....
   If so, what grades are included?.....
9. Do you have a junior high school?.....If so, what grades are included?.....
10. Has there been any unusual change in the population of your city since the census of 1920?.....If so, what?.....
11. Approximately how many children of ages 14 and 15 are out of school with work permits? 14 years....., 15 years.....

DIRECTIONS TO TEACHERS FOR FILLING OUT THE PROGRESS RECORD

The teacher should first see to it that the blanks at the top of the Progress Record are filled out. Under the heading "system of promotion" underline "annual" if promotions take place only once a year, "semi-annual" if they occur at the end of each semester. If some other system is used please indicate briefly what it is. This indication should be entered just under the words "annual" and "semi-annual" if there is sufficient room. If a longer explanation is required please make it under the heading "general remarks" on the back of this blank. The "date of report" should be the date at which the record is filled out, not that at which it is sent to the Bureau of Educational Research. The headings of the various columns in the body of the record indicate what information is desired. The examples given on the first two lines and the following additional explanations will serve to make their meaning clearer.

Column 1. The names of all pupils in your room who are present upon the "date of report" or are only temporarily absent at that time should be included in this column. In other words, the Progress Record should include the records of all pupils who are considered members of your room. In the case of rooms having pupils of more than one grade, teachers are requested to enter the pupils' records so that those of all pupils within each grade are together.

Column 2. If the pupil is a resident of the school district in which you teach enter an "R" in column 2. If he lives outside of it, enter an "N." The school district should be interpreted to include the territory supporting the school system by its taxes and from which pupils may attend the school without paying tuition.

Column 5. In the case of a pupil who has at some former time attended school in your city but who left to attend school in some other city and later returned to your city, the date entered under "date of entering school in this city" should be that at which he returned to school in your city. In other words, no period of attendance at school in some other city should have intervened between the date in this column and the present. The same rule should be applied in the case of pupils who have attended a parochial or private school and later returned to the public schools.

Column 6. In cities that have the annual system of promotion the grade entered here should be entered merely as a number. In those cities that have semi-annual promotions the letter A or B should accompany the grade number to indicate the semester. In the two examples given these entries have been made on the supposition that the first semester of any year's work is called the B section and the second the A section. In case the use of the letters is reversed in your system kindly indicate that fact under "general remarks." The grade entered here should be determined in the same way as was the entry in column 5.

Column 7. The entry in this column should be made in the same manner as that indicated by the first two sentences concerning column 6.

Column 8. The entry in this column should show the number of years lost by failure since entering this system, if the system has annual promotions; and the number of semesters lost by failure, if the system has semi-annual promotions.

Column 9. The figure entered here should show the number of years or semesters gained by skipping grades. The same rule as to years or semesters as was just given for column 8 should be followed.

Column 10. Under "number of semesters out of school" should be entered the number of whole semesters during which the pupil did not attend school. A pupil should be considered as not having attended school during a semester if he was present such a small portion of the time that he was not given any school mark for the semester's work and therefore was neither promoted nor failed.

Column 11. For high school students columns 1 to 10, inclusive, are to be filled out just the same as for elementary pupils and in addition the information asked for under column 11 "for high school only" should be given. The entry in the first column under the heading "number of semester credits" is to be based upon the generally accepted definition of a semester credit. That is, that one semester credit is to be given for a subject carried for one semester and having a daily recitation period. Thus 32 semester credits are usually required for high school graduation. The same interpretation of a semester credit applies also for the column headed "number of semester credits lost by failure."

Column 12. In this column should be entered any other information necessary to a clear understanding of the pupil's progress. In most cases no entry will be necessary here.

General Remarks: Remarks concerning the whole room should be entered under this heading on the back of the sheet, leaving the space in column 12 for remarks concerning individual pupils. If, however, a remark concerning any individual pupil is too long to be placed under column 12 it may be placed under "general remarks" with a note to show to which pupil it refers. Any explanations necessary to make clear the status of the pupils in your room should be given under "general remarks." For example, if part or all of your pupils are in a section that is somewhat ahead of or somewhat behind the place indicated by their grade this fact should be indicated. In the case of departmental organization in which the pupils may be carrying certain subjects in one grade and other subjects in another, the fact should be stated.

Teachers are requested not merely to fill out the record according to the pupil's memory but to take reasonable care to insure that the entries made are correct. The accuracy of certain items of information given can be checked by comparing them with each other. For example, in the case of Thomas Brown it is apparent that if he entered grade 1B in February, 1919, and progressed regularly he should at present be in grade 4A. The entries show that he lost one semester through failure and one semester through absence from school. Therefore he should at present lack two semesters of having reached 4A, or in other words, be in 3A. Since the entry in column 7 shows that he is in 3A at present the various entries check and are probably correct.

As soon as this Progress Record has been completely filled out it should be returned to your principal or superintendent.

UNIVERSITY OF ILLINOIS
COLLEGE OF EDUCATION
BUREAU OF EDUCATIONAL RESEARCH

SYSTEM OF PROMOTION
ANNUAL SEMI-ANNUAL

PROGRESS RECORD

City..... State..... School..... Date of Report.....

Superintendent..... Principal..... Teacher.....

1	2	3	4			5		6	7	8	9	10	11				12
			Date of next birthday			Date of entering school in this city							For High School Only				
NAME	Residence	Age at last birthday	Month	Day	Year	Month	Year	Grade entered	Grade at present	Number of times failed of promotion	Number of times skipped	Number of semesters out of school	Number of semester credits	Number of semester credits lost by failure	Date of entering high school		REMARKS
															Month	Year	
Brexa, Thomas	R	11	Apr.	5	'23	Feb.	'19	1B	3A	1	0	1					
Smith, John	N	14	Dec.	27	'22	Sept.	'17	5B	10B	0	0	0	8½	0	Sept.	'21	
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	

APPENDIX B

The School Systems That Participated

The school systems of the following cities and towns contributed data for their elementary schools, their high schools, or both.

Abingdon	Chillicothe	Harvard	Mendota
Altamont	Clinton	Harvey	Metropolis
Altona	Coffeen	Havana	Minonk
Amboy	Colfax	Hebron	Momence
Anna	De Pue	Herrin	Mt. Carroll
Arcola	Des Plaines	Highland	Morris
Assumption	Dolton	Hillsboro	Naperville
Atwood	Downers Grove	Hinsdale	Nashville
Aurora, East	Dundee	Huntley	New Trier
Aurora, West	DuQuoin	Joppa	Nokomis
Bartonville	Dwight	Keithsburg	Oak Park
Bloomington	East Alton	Kewanee	Oblong
Blue Island	Eldorado	Knoxville	Onargo
Bridgeport	Evanston	La Salle	Paxton
Bushnell	Franklin Park	Lebanon	Pecatonica
Carmi	Freeport	Lyons	Pekin
Carrollton	Galena	McHenry	Pinckneyville
Carthage	Galva	McLean	Pittsfield
Casey	Geneseo	Macomb	Rio
Catlin	Gilman	Madison	Tennessee
Cerro Gordo	Glencoe	Marion	Victoria
Charleston	Glen Ellyn	Mascoutah	Wataga
Chenoa	Granite City	Matherville	Yates City

The four counties which contributed data were DeKalb, Knox, McDonough and Massac.

APPENDIX C

Non-Resident Pupils

The following table shows the number of non-resident pupils reported and the percent that they are of all pupils in school. As was stated previously, these non-resident pupils were not included in any of the tabulations made except those having to do with class size. To the data presented in this table the following points may be added which are evident from a study of more detailed tables. The percent of non-residents in elementary schools varies from 0 to 21 and in high schools from 0 to 55. There is a well-marked tendency for the percent of non-residents to be greater in the smaller systems.

TABLE XXXVI. THE NUMBER OF NON-RESIDENT PUPILS AND THE PERCENT THAT THEY ARE OF ALL PUPILS

Grade	In City Schools		In Rural Schools	
	Number	Percent	Number	Percent
I	85	1	36	4
II	93	1	20	3
III	69	1	19	3
IV	77	1	31	4
V	60	1	20	3
VI	84	1	19	3
VII	147	2	20	2
VIII	131	3	25	5
I-VIII	746	1	190	3
IX	677	17		
X	404	14		
XI	355	17		
XII	264	17		
IX-XII	1700	16		
I-XII	2446	4		

APPENDIX D

Kindergartens

It had been planned to make a study of kindergartens and of their effect upon school systems, similar to that of departmental organization. With this in mind, a question was asked as to which systems have kindergartens and the enrollment in each. Only thirteen of the ninety-two cities reported having kindergartens and of these two did not give the attendance. The attendance reported by the others varied from 2 to 237, the total being about 800. These data are evidently not sufficient to form the basis of any study concerning the effect of kindergartens upon elementary or high-school work.

THE UNIVERSITY OF ILLINOIS

THE STATE UNIVERSITY

URBANA

DAVID KINLEY, PH.D., LL.D., *President*

The University Includes the Following Departments

THE GRADUATE SCHOOL

THE COLLEGE OF LIBERAL ARTS AND SCIENCES (Ancient and Modern Languages and Literatures; History, Economics, Political Science, Sociology, Philosophy, Psychology, Education; Mathematics; Astronomy; Geology; Physics; Chemistry; Botany, Bacteriology, Zoology, Entomology; Physiology; Art and Design; Home Economics)

THE COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION (General Business, Banking, Insurance, Accountancy, Railway Administration, Railway Transportation, Industrial Administration, Foreign Commerce; Courses for Commercial Teachers and Commercial and Civic Secretaries; Commerce and Law)

THE COLLEGE OF ENGINEERING (Architecture; Architectural, Ceramic, Civil, Electrical, Gas, General, Mechanical, Mining, Municipal and Sanitary, Railway Engineering, and Engineering Physics)

THE COLLEGE OF AGRICULTURE (Agronomy; Animal Husbandry; Dairy Husbandry; Farm Mechanics, Farm Organization and Management; Horticulture, Landscape Gardening, and Floriculture; Agricultural Extension; Home Economics)

THE COLLEGE OF LAW (Three-year and four-year curriculums based on two years of college work)

THE COLLEGE OF EDUCATION (General Education; Bureau of Educational Research; Athletic Coaching; Agricultural Education; Home Economics Education; Industrial Education; Music Education; University High School)

THE CURRICULUM IN JOURNALISM

THE CURRICULUMS IN CHEMISTRY AND CHEMICAL ENGINEERING

THE SCHOOL OF RAILWAY ENGINEERING AND ADMINISTRATION

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